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THE  
MONTREAL MEDICAL JOURNAL.

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A Monthly Record of Medical and Surgical Science.

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## MONTREAL MEDICAL JOURNAL.

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## Original Communications.

## NECROSIS OF THE BLADDER.\*

By F. A. L. LOCKHART, M.B., &amp;c.

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*Mr. President and Gentlemen,*—The exact pathology of inflammation of the walls of the bladder, going on to separation of the whole or patches of the wall, and involving one or more of its coats, seems to be involved in so much obscurity, that I think every case coming under our observation should be minutely examined into and discussed in order to bring about some degree of unanimity upon the subject, in its nomenclature at all events. It is for this reason that I have ventured to bring before your notice this evening the following case, which was under my charge in the Edinburgh Infirmary, together with a few remarks upon the subject of necrosis of the bladder.

## CASE REPORT.

A. N., single, aged 28 years, waitress in a hotel, was admitted to ward 28, R.E.I., on April 27th, 1890. On admission, she complained of frequency of micturition, with a burning pain during the act, and a bearing-down pain, which was especially bad just after the bladder was emptied.

*History.*—The patient had a child two years previous to admission, the symptoms coming on just after the labor, which was very protracted. Labor pains began on a Monday, but the process was not completed until the following Friday, when a

\* Read before the Medico-Chirurgical Society of Montreal.

doctor was called in, a midwife having been in attendance until that day ! The following is his own account of the case : " When I arrived I found that uterine inertia had taken place, the os was fully dilated, but the head was retained at the brim. Before I saw her, she had frequent calls to micturate, which made passing the catheter unnecessary. I applied the forceps and delivered with difficulty, requiring a great amount of traction. The perineum was badly ruptured. I wanted to suture, but the patient and those about her objected on the plea that she had suffered enough already. There was marked incontinence of urine during convalescence, but this improved materially as she grew stronger, though up to the time when I last saw her she complained of it, and found it to greatly interfere with her work." (He then goes on to apologise for his scanty notes of the case, as she was not a regular patient of his.) The improvement continued until she could retain her urine for three hours during the day, but during the night she had to pass it every few minutes. In two months this improvement ceased, and she got steadily worse up to the date of her admission. The urine has always been very hot, irritating and thick, with a deposit on standing.

*State on admission.*—The patient makes water every few minutes, during both night and day, but especially often at night. The urine is alkaline in reaction, thick, and deposits pus and phosphates on standing. On making a local examination, the perineum was found to be torn to within half an inch of the anus. The cervix and uterus were normal. The sound only passed four inches into the bladder, and the meatus urinarius was very tender.

*Treatment.*—This consisted in washing out the bladder once a day with a warm solution of carbolic acid (1-60), together with internal medication, giving belladonna, hyoscyamus, buchu, and half an ounce of a saturated solution of boracic acid three times a day.

On June 12th an attempt was made to repair the perineum by Tait's method, so the local treatment of the cystitis had to be discontinued. As incontinence of urine came on the day after

the operation, the tissues became so sodden that the stitches would not hold.

On July 5th the incontinence was still present. During the previous night the patient suffered from intense pain in the hypogastric region, and about 8 A.M. passed two pieces of membrane, together with a quantity of granular and fibrous débris, per urethram. The incontinence lasted for about two weeks after passing the membranes, but since then she steadily improved under the above treatment, which was resumed a few days after the membranes were passed. The patient was now very weak, so general tonics were added.

On Sept. 6th she left hospital, being practically cured of her bladder trouble, as she could retain her urine as long as she chose.

#### *Description of Membranes.*

(a) *Macroscopic.*—The pieces of membrane passed were roughly ovoid in shape, being smooth on one side and rough on the other. One piece was about the size of a silver dollar, while the other was about half that size, the thickness varying from  $\frac{1}{16}$  to  $\frac{1}{32}$  inch.

(b) *Microscopic.*—Four layers may be made out, but they have no definite lines of demarcation. They may be named as follows: 1. Fibrous. 2. Fibro-granular. 3. Vascular. 4. Musculo-granular.

The *fibrous* layer is composed of elastic and connective tissue fibres running longitudinally. This layer is very thin, and is entirely wanting at some parts.

The *fibro-granular* layer, as its name implies, consists of fibrous and granular material. The fibrous element is composed of both white fibrous and yellow elastic tissue, the latter being scattered throughout the layer. The white fibrous tissue runs in different directions through the specimen, the bundles interlacing with each other here and there. Some of the bundles are large and dense, while in other places only a few fibres are to be observed. The granular material fills up the spaces between the bundles. This contains some connective tissue corpuscles, but in most places the tissue is so degenerated as to be

unrecognizable. In patches here and there, it is even hyaline. This layer merges rather suddenly into the next, viz,

The *vascular* layer, which contains most of the blood-vessels. These vessels are both numerous and congested, a few being thrombosed. More or less extensive hemorrhages have taken place into the perivascular tissue, which is very granular.

In the fourth or *musculo-granular* layer, muscular tissue may be seen in various stages of degeneration. In one or two places it appears as bundles of fairly normal tissue, but the bundles are isolated in the midst of granular débris, the tissue here being very open in structure.

*Structure of the Normal Bladder.*—As all here are well acquainted with the structure of the normal bladder, I will dismiss it in a few words.

1. When the bladder is distended, the peritoneal coat extends over the superior and posterior surfaces, as well as the upper parts of the sides, but when the organ is collapsed, it merely covers its upper aspect.

2. The sub-peritoneal coat consists of areolar tissue, and is of varying thickness.

3. The muscular coat consists of three layers, viz., external longitudinal, middle circular, and internal longitudinal. Of these three layers, the first two are well marked, but the last is poorly developed, and at parts some fibres run obliquely.

4. The submucous coat consists of areolar tissue, together with elastic and connective tissue fibres. This coat contains most of the blood-vessels.

5. The mucous membrane consists of transitional epithelium, with a few mucous follicles and racemose glands in it.

The blood-vessels enter the bladder from the base, with the exception of the superior vesical arteries, which run through the upper parts of the posterior false ligaments of the bladder.

*Nature of the Process.*—The process described above has received various names from different writers upon the subject, such as “croupous” or “diphtheritic inflammation of the bladder,” “exfoliation of the bladder,” “exudative cystitis,” “plastic cystitis,” etc., none of these terms indicating the pro-

cess by which the tissue is thrown off. The terms *croupous* and *diphtheritic*, in fact, imply the formation of a distinct false membrane. I will not venture to deny that such does occur, for it is well known that it does, but there is, in addition, a process called "necrosis of the bladder." This name has been suggested by Dr. F. W. Haultain of Edinburgh, who, in a valuable monograph upon the subject, has proved the process to be one of distinct necrosis, the tissue being killed and thrown off just as in the case of a necrosed bone.

Now the question is, is this a false membrane or is it an integral part of the wall of the bladder that has become necrosed? I agree with Dr. Haultain and maintain that it is a necrotic process that has occurred in the vesical wall. The structure of the specimens in these cases differs from that of a false membrane. In the latter, you have leucocytes held together by bands of fibrin or connective tissue fibres, if the exudation has become sufficiently well organized; and it may contain more or less degenerated cells from the subjacent tissue. In the specimens from necrosis of the bladder, you find broken down granular cells held together by bands of fully formed white fibrous and yellow elastic tissue. The presence of muscular tissue in different stages of degeneration I hold to be further proof of the process being a necrosis of previously formed tissue, and not of the formation of new tissue.

The exfoliated membrane seems to be replaced by inflammatory tissue which has become fibrous. In fatal cases, the bladder has been seen to be surrounded by an area of inflammation, all the adjacent structures being matted together, forming a kind of secondary sac. The specimen from one of Dr. Haultain's cases shows this very well, there being two whitish patches on it somewhat resembling peritoneum. On closer examination, these patches proved to be pieces of this new fibrous tissue, which had adhered to the exfoliated sac and been torn off with it. A portion of the sac had separated and fallen across the urethral opening, so preventing the escape of urine. This collected behind the sac, forcing it further and further down through the urethra, as well as preventing its rise with the bladder wall

as this viscus became more and more distended, so tearing off patches of the newly-formed secondary sac.

*Cause.*—Of all the causes of necrosis of tissue, only two require to be considered here, viz. (1) mechanical injury and (2) interference with the circulation; and both may be taken together.

Let us look for a moment at the position of the female bladder. In the non-pregnant condition, the bladder is a pelvic organ entirely, as in the male. Even during pregnancy it is pelvic up to the end of the first stage of labour, when it becomes pelvo-abdominal, the neck and base lying behind the symphysis pubis, while the rest rises into the abdomen, but, on completion of the second stage of labour, it becomes pelvic again. These conditions are very clearly shown in the plates accompanying Dr. Barbour's very instructive paper on the anatomy of labour in the *British Medical Journal* for November 1st, 1890. We are now in a position to study how the bladder may be mechanically injured and have its blood supply cut off during labour.

As I have before stated, by far the greatest part of the blood supply of the bladder enters through its base. This, as has been seen, lies behind the pubic bones during the second stage of labour. The descending head presses the soft vesical wall between the cranial bones of the foetus and the hard pelvic bones of the mother, but, normally, the duration of the pressure is too short to do much injury. If, instead of for two or three hours, this pressure is applied for a day or more, it can be readily understood what damage the continuous crushing does to the soft parts. Besides the direct mechanical injury inflicted by the pressure on the bladder walls themselves, the channels through which they receive their blood supply are pressed on so that it is interfered with to a greater or less extent. Retention of urine may also be brought about by this pressure of the neck of the bladder between the foetal head and pubic bone (and it usually accompanies this condition), and increases the difficulty of the circulation through the bladder walls by the tension set up by the collecting urine.

If we look over the table which Dr. Haultain collected (and

which I here show you), I think you will agree with me that interference with the circulation by pressure of the head and retained urine, and the mechanical injuries inflicted on the tissues themselves by this pressure, form the chief cause of this condition of necrosis. He collected fifty-three cases of necrosis of the bladder in females and three in males. Out of the former, no less than 42 or 79.2 per cent. had suffered from retention of urine, of which number 31 had retroposition of the gravid uterus. All but three were connected with pregnancy, occurring either before or after labour, and where the time is stated, it may be seen that pressure was exerted for from twelve hours to thirty-five days. In one case the retention was accompanied by extra-uterine gestation, while in that recorded by Tulpius no cause at all for the necrosis is given. Orłowski reports a case of vesical necrosis, which followed dysentery, in a girl three years old; and Lemaire reports a case of the same in a patient who had also been suffering from dysentery, these two cases showing that mere lowering of the system will be an active predisposing, if not immediate, cause.

Now as to the cause of the necrosis in the case that was under my own observation. There is no doubt but that the pressure of the child's head for so long a time set up an unhealthy action in the vesical walls, as I have endeavoured to show can be caused by pressure. The patient having such frequent calls to micturate shows that there must have been irritation of the bladder by the head or else over-distension; and the passing of the two pieces of membrane looks as if the pressure was upon the anterior and posterior walls, a piece coming from each. This pressure must have caused paralysis of the sphincter vesicæ, as well as further injuring the bladder, as there was marked incontinence of urine "for some time after labour," it only improving "as the patient grew stronger." From the history of the case, it is uncertain whether there was retention or not, as the frequent micturitions might very easily be the overflows of an over-distended bladder that are known to occur in cases of retention, the patient merely having been under the care of a midwife for the greater part of the time.

My own theory of the necrosis in this case is, that the vessels supplying the necrosed areas were so injured that exudation of corpuscles into the surrounding tissues occurred from the congested vessels, and by their pressure cut off the blood supply to these parts, so causing their death. The patches of dead membrane remained attached to the bladder wall by fibres of living tissue, into which one or two very fine blood vessels probably ran, so keeping the tissue from entirely disintegrating. The slight dilatation that the viscus must have undergone each time that it was washed out set up an acuter inflammation and so caused their separation and expulsion. Their presence in the bladder was quite sufficient to account for the symptoms of cystitis that had existed ever since the birth of the child, a steady improvement, ending in complete recovery, setting in as soon as the irritation set up by them was removed.

Some may ask if the necrosis was not set up by irritation of the catheter? I certainly do not think so, although this may have aided in causing the eventual separation of the tissues. Before the catheter was used at all the patient had all the signs and symptoms of a decidedly abnormal condition of the bladder walls, all being traceable to labour.

*Diagnosis.*—There is absolutely no means of diagnosing this condition from that of ordinary cystitis until the membrane can be seen to be separated, either by its spontaneous appearance at the meatus urinarius externus or by using the urethral speculum. If, however, the patient has all the symptoms of cystitis, following one of the above-mentioned causes, you may suspect necrosis to have occurred.

*Prognosis.*—This, of course, varied with the general condition of the patient and the extent and depth of the necrosed tissue. In one of the two cases that came under Dr. Haultain's care, the patient recovered, but had complete incontinence. In this case the whole lining of the bladder, including patches of peritoneum, came away. In his other case of complete necrosis, the patient died a few hours after her admission to the hospital. Even after the secondary sac has formed, death may occur from its rupture, as in the case reported by Krukenberg. On the

whole, however, prognosis, as regards life, is good, and unless the whole lining of the bladder has come away, control of the sphincter is regained sooner or later.

*Treatment.*—There is no special form of treatment for this condition, that indicated for ordinary cystitis being also indicated here, except that you should not wash out the bladder for several days after the passing of the membrane for fear of causing perforation or rupture of the viscus, and you must keep up the patient's strength with stimulants.

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## OUR PROJECTION OF A SOUND SOURCE IN SPACE.\*

BY J. W. STIRLING, M.B., &c.

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The title of my paper would have better been "our present *lack* of knowledge," than our knowledge of the projection of sound in space by the human ear. It is very remarkable how hazy the knowledge of the scientific world is as yet in regard to the functions of the various parts of the inner ear. We know that it is the end organ of the auditory nerve, but when one proceeds to specialize further, the subject is to a certain extent enveloped in doubt. This is the more striking when we compare it with our knowledge of the functions of the eye and its various elements, for in the latter we venture upon well trodden and thoroughly known ground.

Before proceeding to the subject of this paper allow me very briefly to run over the anatomy and physiology of the inner ear, as it will assist in making the subject matter clearer later on.

Hearing occurs in one of two ways,—either through the bones of the head, or per meatum—through the bones, as through all solid bodies, by waves of condensation. Let us glance at the latter and usual way.

The acoustic waves enter the meatus and are transmitted from the membrana tympani by means of the ossicles of the middle ear to the fenestra ovalis. Here the repeated shocks of the stapes set up a series of waves in the lymph of the labyrinth. In order

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\* Read before the Natural History Society of Montreal, April 27th, 1891.

to allow of the waves being transmitted through the lymph there must be yielding points, and these occur at the fenestra rotunda, the two openings of the aqueduct of the vestibule, the membranes of the aqueduct of the cochlea, and the pores of the blood-vessels in the bone.

Impulses started in the fluid of the labyrinth would thus result in its movements back and forth so as to produce a friction against the end apparatus of the auditory nerve. This friction would be increased by the action of the otoliths found in the fluid. Thus the waves started at the fenestra ovalis would be diffused over the vestibule and into the scala vestibuli of the cochlea, where they would flow to its head, being prevented by the separating membrane from entering the scala tympani.

It is not known certainly to what extent these waves flow through the helicotrema into the scala tympani, nor what are the exact relations between the waves in the scala tympani and those in the scala vestibuli. The basilar membrane is thrown into vibration through the unequal pressure of the moving fluid, and by its vibrations stimulates the nervous structures, ending in it, giving rise to the perception of sounds.

In the same manner the lymph of the semi-circular canals, their ampullæ and vestibuli, is thrown into movements.

The structure of the end apparatus of the vestibule and semi-circular canals is evidently not adapted to the analysis of musical tones like the basilar membrane.

The otoliths found in the ampullæ and also the hairs are not capable of regular sympathetic vibrations; moreover, they form no scale of structures corresponding to the scale of sensations of tone. This fact led Helmholtz to consider that tones—*i.e.*, sounds of regular periodic vibrations—are heard only by the cochlea, while noises—*i.e.*, sounds of short, temporary, irregular vibrations—are procured by the saccule and ampulla. Helmholtz has, however, abandoned this theory since Exner has shown that a tone pitch is also perceived in noises.

The function of the semi-circular canals has mainly to do with the space sense, acting in the preservation of our equilibrium, which, despite emphatic contradictions, Breuer of Vienna has

lately proved very successfully to be the case. Breuer stimulated the ampullæ of the various canals by the galvano-cautery and electricity. He found that on stimulating the utricular end of the ampulla there was a movement of the head in the plane of the canal so stimulated and to the same side as that to which the canal appertained; while if the canal end of the ampulla were stimulated, the movement was in the plane of the canal, but to the opposite side.

However, there is little doubt but that the ampulla and canals have something to do with sound perception, and that likely in the way of perception of the source of a sound. I will dilate on this theory later on.

It is well at the outset to bear in mind that hearing is a mental act. Every auditory sensation is an affection of the mind, recognized as connected with an extra mental reality through the activity of the auditory nerve.

All mental sensations arising from stimulation of the auditory nerve are called sensations of sound. We know nothing directly through sensations either of the structure of the ear or of vibrating strings, or particles of air or of the physics of music.

That there is a certain sense of space or localization attendant on all sense perceptions there can be no doubt, but it is still a question what determines this power of localization. It is undoubtedly a matter of memory, experience and education.

Preyer of Jena, in 1884, made a series of very interesting investigations on infants and very young animals, in order to determine, if possible, the nature and development of this space sense. As a result, he found that at a very early stage of psychical development, animals and children regard the various parts of their body as entirely distinct from themselves. The chick plucks at its own nails, just as it would at the corn thrown out to feed it. The child tried to tear off its finger or divide its foot from its leg. Only later on do they begin to grasp the idea that limbs, etc., appertain to themselves and are distinct from the surrounding world, and then begin to locate each sensory impression correctly in a certain spot or direction.

It would be quite impossible, after this, to have any conscious

sensory impression which will not have a certain sense of space or position in regard to the body, once that this latter is perceived to be distinct and separate from the rest of the universe.

Children are born deaf and only begin to hear about the fourth day after birth. About the eleventh week they begin to move the head in the direction from which a sound comes. A week later the turning of the head in the direction of the source of a sound is sudden and rapid, even when the glance of the eye does not take at once the correct direction, but once the direction was discovered the child hearkens with the closest attention. After the lapse of two or three weeks, the turning of the head toward the source of sound occurs with the certainty of a reflex movement.

Now for the first time distant sound impressions are perceived. The perception of sound through the bones of the head occurs somewhat earlier than the twentieth month. Darwin, Vierordt and Demme give varying periods as to the first perception of the direction of sound by an infant, the extremes being twelve weeks for the earliest and seventeen weeks for the latest.

Guinea-pigs noted sound and its direction the very day of birth, although deaf immediately after birth. The little auricles contracted and moved with great rapidity, comparable to the action of the pupil under light stimulus.

Cats and dogs I have found to give similar results, although they have a tendency to project a sound on their own level even though coming from above them.

We thus see animals are in advance of infants in regard to the early age at which they appreciate sound and its direction. As Preyer remarks, the child hears nothing at first, then hears some sounds indistinctly, later hears many sounds indistinctly. Now very gradually he distinguishes an individual sound distinctly from among many indistinctly, and finally hears much distinctly and distinguishes strong high tones earlier than deep ones. Only when this latter stage is being reached does the infant seem to obtain some certain idea as to the direction from which a sound comes.

This perception of sound and its direction, in common with all

perceptions, is the result of an extremely complex activity of the mind. It is curious to note how, as it were irrationally, the child undertakes the synthesis of the number of sense data which it involves.

The exactness, however, of this space perception varies greatly in the different senses. The eye is very exact, thanks to its great motility and manifold innervation. The skin is not nearly so exact, and varies in different parts of the body. The hearing perceives not only distant sources of sound, but locates sound in the interior of the head, and perceives very slight differences in the pitch of sound by the vibration of the air in the external meatus. Only thus far has the entire tone perception by means of the ear any sense of space, for although these sound sources are perceived, they are rarely projected correctly. Hence this highly developed function is rarely used for the perception of space sense or orientation.

The oldest theory in regard to our perception of the direction of a sound is what is known in Germany as the *recht-links*, or right-left localization. The perception of direction according to this theory depends on the relation of either meatus auditorius externus to the source of the sound, and we obtain our information, especially, if we turn our head in the supposed direction of the sound.

If both ears are stimulated to the same extent, we project the sound source in the median plane anteriorly; but when one ear is stimulated more strongly than the other, the sound source is always projected to the side of the most powerful sensation. In testing this by moving a sounding object in a horizontal circle round the head on the level of the meatus auditorius externus, Rayleigh found that a variation of 1 per cent. in the strength of stimulus between the two ears is perceived. This seems slightly overdrawn, as 10 to 20 per cent. have been the figures asserted by all other authorities, and indeed the marked uncertainty of aural projection would favour the acceptance of the latter figures. Rayleigh further asserts that we perceive the direction of noises mixed with musical tones more easily than that of pure tones.

The position and shape of the auricle is an important factor in this right-left localization, for the projection of a sound is much more faulty in those cases where the ears are closely applied to the side of the head ; at the same time, in those cases in which the auricles project from the side of the head, the posterior projection is generally false. Simple proof of this effect of the auricle may be obtained by placing the hollow of our hands in front of the ears, when any sound perceived will invariably be projected backwards, no matter from what direction it may come.

That the power of orientating ourselves in space with reference to external sounds varies in different individuals cannot be doubted. It is no doubt an acquired art, and depends on attention and experience, as well as the accurate interpretation of the smallest details. Just as in the matter of the vision of savages, which is proverbially so acute, it is a question of attention and practice in the interpretation of minute indications, and the perpetuation of this type through the requirements of their life.

Weber thought we could tell the direction of a sound by means of the perception of the varying swing of the membrana tympani. He instanced, in support of this theory, that eccentric projection is hindered if the meatus is filled with water. It hinders, but does not prevent the perception of the direction ; about this I will speak later on.

These facts of the perception and projection of a sound to the side of the greatest intensity gave rise to the theory of acoustic shadows or of the amount of covering power which the sound produced by waves of a given intensity entering one ear would have upon the sound produced by waves of a different intensity entering the other ear.

According to Kessel, the best binaural audition is produced when the sound proceeds from the mesial plane anteriorly ; the best monaural when the projection is exactly in a line with the meatus, at right angles with its opening. Kessel further advances the function of the pinna as being the main factor in determining the perception of the direction of a sound. He divides the pinna into five auditory districts which are sharply defined from

one another, and are characterized by the fact that they convey sound to the ear with a different intensity, according to the direction of the head at rest or during movement. These districts for the perception of sound are: anterior, posterior, superior, inferior and central or direct. The different auditory districts are brought into use by means of suitable movements of the head; and in association with the sense of sight, the direction from which the sound proceeds is ascertained.

One more point in connection with this right-left localization. Steinbach has shown that both binaural and monaural audition may be direct, indirect, or mixed, depending on the direction of sound source. In the direct, the sound reaches the ear directly; in the indirect, only after one or more reflections; in the mixed, both with and without reflections. In binaural audition, both ears may be stimulated by the direct or indirect, or one ear by direct, the other by indirect sound waves.

The intensity of the perception of hearing depends upon the sum of the sound waves which are reflected from the pinna into the meatus; the size of the reflecting surface of the pinna, on account of its complicated form, being almost the same for the different directions of the sound waves. The direction of sound, Steinbach holds, is decided by the right-left theory.

If the source of the sound is in the district of direct audition, then its direction can be defined with tolerable certainty; nevertheless, each individual has for this judgment his own standard, which depends upon the angle which the two auricular surfaces make with each other. The smaller the angle the more certain the judgment.

Since the best binaural audition occurs when the sound source is directly in front in the visual direction, one involuntarily turns the face to the person speaking.

If the angle which the two auricles form is less than  $60^\circ$ , and this is usually the case, one hears better with one ear than two, and hence turns one ear in the direction of the source of sound. Changes of direction in direct audition are detected by alteration in the intensity of sound, whereas in indirect audition other factors assist.

Judgment, together with the assistance of auditory impressions which are from experience familiar, play a principal part.

In mixed binaural audition, in which direct waves of sound only reach one ear whilst both ears can be struck by indirect waves, one can only vaguely determine the direction of the sound, and its origin is placed in the district of that ear which is struck by the direct sound waves.

If we wish to define more accurately the direction of the sound in indirect or mixed binaural audition, we are assisted if we turn our head so that the sound is received from the district of direct binaural audition or from the boundary of two adjacent auditory districts.

Daily experience teaches us that secondary conditions enable us to assist the power of localization.

It is of interest to note here that a patient of Charcot's, in Paris, had absolute insensibility of both drums and auditory canals. When his eyes were closed he could not detect the direction in which a watch was held although he heard it distinctly.

These various theories having the right-left localization as their foundation were all unsatisfactory, not accounting for many projections. Münsterberg further elaborated the theory by bringing the semicircular canals into consideration as a factor. He considers these canals to be stimulated by sound waves, which stimulation gives rise to reflex impulse for movements of the head, and upon this latter the localization of the sound source depends. It is a theory which fails, as one can readily see, when it comes to a question of the localization of two simultaneous sounds from different directions. The right-left localization theory, without this addition of Münsterberg's, can account for the perception of two simultaneous sounds coming from different directions, as v. Kries has shown to be possible, at any rate, after a little practice, and if the sounds are of different pitch, the root of the matter being the comparison of the intensity of each sound in the two ears. In some individuals the prompt and accurate localization of the direction requires, as Hensen says, something more than the shadow theory to account for them. So much, then, for the right-left theory of localization.

There is one point where it fails badly, and that is, the projection of any special point in the median plane; a sound stimulating each ear with equal intensity is referred to the median plane, but no particular point in the said plane can with certainty be projected. One can hence perceive that without the addition of some new theory of the functions of the auditory organ, a discrimination of the various sound directions could not be explained by the right-left theory.

Preyer of Jena, in 1887, instituted a series of very exact investigations in regard to the extent and limitations of our power of appreciation of the direction of sound source. He examined a series of individuals in the same manner repeatedly. The sound tests were a toy called "cri-cri" and the tick arising from opening and closing the current on a telephone. Both sounds are short and sharp, so that the factor of reflexion can be excluded, as it is scarcely noticeable. The tests were applied in the thirteen different areas of the head, as follows:

- (a) Three primary axes, the vertical, sagittal and transverse.
- (b) Six secondary axes—antero-superior and postero-inferior, antero-inferior and postero-superior, right inferior and left superior, left inferior and right superior, right anterior and left posterior, left anterior and right posterior.
- (c) Four tertiary axes—right antero-superior and left postero-inferior, right antero-inferior and left postero-superior, left antero-superior and right postero-inferior, left antero-inferior and right postero-superior.

Giving thus with both terminations of their areas twenty-six tests. Preyer measured the false projection when it occurred by the angle which the axis, in which the test was made, formed with the axis in which it was projected by the person being tested.

I will not reproduce his tables, as they are far too vast for a paper like this. The conclusions I will give. Out of 2,080 tests he obtained 29.4 per cent. correct, so that chance is excluded. The greatest number of failures were when the sound came from below. Never was a sound from the left projected to the right. Right and left were with far more certainty distinguished by the ear alone than anterior and posterior or superior

and inferior. In the transverse plane 38.7 per cent. were correct, in the horizontal plane 35.8 per cent., and in the sagittal 31.5 per cent.; the percentage falling in the sagittal plane, as here the right-left localizing is wanting. Again, a greater number of superior projections were correct than of inferior; 37.6 per cent. of various superior projections to 15.5 per cent. of inferior. Lastly, Preyer found 32.5 of the posterior projections were correct to 18 per cent. of the anterior.

The results of the examination also showed—

(1) That each of the twenty-six directions had been correctly projected; true, some very seldom, *e.g.*, anterior inferior.

(2) That no sound coming from the left side was ever projected to the right and *vice versa*—*e.g.*, left antero-superior for right antero-superior.

(3) That no sound coming from the right or left was ever projected in the median plane.

(4) That the converse of the last fact holds—*i.e.*, no sound from a point in the median plane was projected to the right or left.

(5) Every error which arises in the median plane occurs with nearly the same frequency on either side of the head.

Further, certain directions very rarely or not at all are mistaken for certain others—*e.g.*, inferior for anterior; inferior and superior, inferior and antero-superior, anterior and postero-inferior never, and the corresponding directions on the right or left side only rarely.

On the contrary, many directions are more frequently mistaken for certain others than correctly projected—*e.g.*, anterior for antero-superior, posterior for postero-superior, etc.

The greatest errors were those of  $180^\circ$ , and occurred only in the median plane. The most frequent errors were  $35.3^\circ$  to  $45^\circ$ , and, as one would suppose, the number of mistakes were about the same on either side of the head. The large percentage and size of the errors in the median plane are, as one can readily see, caused by the elimination of the right-left meatus projection. The correct percentage (31.5) in the median plane seems to require something more than the right-left theory or any of its

modifications detailed already to account for it. More especially when one compares this percentage with that of the transverse plane (38 per cent.), which it so nearly approaches. In this we are assisted by the study of comparative anatomy, as Preyer has pointed out.

Fishes have no labyrinth, only vestibule and semicircular canals, yet they hear, and, despite the absence of an external meatus, they undoubtedly perceive the direction from which a sound comes. Hence we must infer two things :

1st. It is by their semicircular canals that they perceive the direction of the sound.

2nd. That the course of the impulse must be through the bones of the head or by head conduction.

Further elaborating the first factor, it is quite comprehensible how that one semicircular canal will be stimulated more than the other two, or sometimes two more than the remaining one, according to the direction from which the sound stimulus comes.

Bone or head conduction is an established fact that requires no further proof here ; but one can understand how, from the denser medium surrounding the fishes head, this would be more favoured than in animals living in the air.

Sound waves from different directions and of varying intensity would in every vertebrate skull set in motion the endolymph of the membranous semicircular canals, with corresponding rapidity and intensity of vibration, and isochronously on account of the curvature of every part of the canal wall.

Now these motions set the hairs of the ampulla into sympathetic vibration, and one has only to consider that by this stimulation of one ampulla through the vibration of the fluid of the corresponding canal a different sound sensation, although of the same pitch, intensity and quality, must arise than that caused by the same stimulus acting on another canal and ampulla, as it is another set of nerve fibres which is stimulated. Considering these factors, one cannot but hold this difference of sound sensation as being one of space.

The animals have, without exception, for innumerable generations, considered, if the nerves of the ampulla, say, of the left

horizontal canal, were more powerfully stimulated than those of the other two, that the sound came directly from the left, and in like manner for the other two ampullæ, the superior and posterior, the sound must come from above or behind.

The specific energy of the ampullæ is a sense of space in connection with sound, and more precisely a sense of direction, the perception of a particular direction depending on the particular one or pair of canals which may be stimulated most powerfully as follows :

1. The horizontal canal is most powerfully stimulated by sound from a direction on the same side in the horizontal plane.

2. Superior vertical canal, which has a direction outwards and forwards, is most markedly stimulated by a sound from above, in front, and to the same side.

3. Posterior canal, which has a direction downwards, backwards and outwards, perceives most acutely sounds from below, behind and the same side.

If two sounds of different intensity come from opposite sides of the head, the sound is projected in the direction of that of the greatest intensity. If both sounds are of equal intensity and pitch, they are projected in the median plane. Preyer applies this theory to all the high vertebrata.

Preyer further says that in any case all three canals are stimulated, of course those of the side nearest the sound source more powerfully than those of the opposite side, and again of those canals of the more powerfully stimulated side, one or two more powerfully than the remaining, depending on the direction from which the sound came. This hypothesis being correct, then must all those sound directions be frequently confused with one another, in which a nearly equally strong stimulation of the different ampullæ occurs—*e.g.*,

Anterior—Ant.-sup.

Post.—Post.-inf.

Post.-inf.—Inf.

Ant.-sup. left—Sup. left.

Ant. left—Sup. left.

Ant. left—Ant.-sup. left.

Post. left—Post.-inf. left.

This Preyer found to be really the case.

The decisions were very uncertain and varying *in re* antero-

inferior, left antero-inferior, and right antero-inferior directions. Preyer considers this due to the stimulation of all the ampullæ being of equal intensity.

By normal hearing, a sound from the left is never projected to the right, and *vice versa*, on account of the much greater strength of the stimulation of the ampulla of the side nearest the sound. For the same reason, no sound from the left or right is normally projected in the median plane, nor one in the median plane projected to the right or left.

Preyer next experimented with both ears closed, first by pressing in the tragus, or by filling the meatus with a solution of sodium chloride. The results arrived at were as follows :

1. The correct right and left projections which had been so good before were now uncertain. This being clearly to be expected since the horizontal canals are more easily affected by the movement of the stapes produced by ærial sound vibrations from the right or left than are the other two canals, the stapes lying in an almost parallel plane to the horizontal semicircular canal. Hence the cutting off of the ærial transmission by the meatus must annul the effects of this factor.

2. The absolute transposition of right to left or of either side to the median plane, and *vice versa*, only occur as with open ears, for the first few trials. This holds even in a large series of experiments; hence one cannot discover a difference in audition by head conduction as compared to the ordinary audition.

3. The recognition of the direction is greatly increased in difficulty, likely from the absolute decrease in intensity of the sounds, and correspondingly relative decrease of the difference of intensity.

4. The number of correct decisions is greatly lessened.

In regard to the perception of sound direction with one ear closed, Chladni found, in 1802, that sound is always projected to the side of the open ear. (If bone conduction is equal normally to ærial, then sound would appear to come from the side of the closed ear.)

The idea is false that in usual audition the sound is entirely conducted by the labyrinthine fluid. Chladni showed, in 1802,

that much is heard even after both ears are stopped. (Ewald has just demonstrated on pigeons that after removal of the labyrinth they perceive sounds acutely; hence that the trunk of the auditory nerve possesses power of sound perception. Only after destruction of the trunk were the pigeons completely deaf.)

Kessel says that with open ears the head conduction plays an important rôle, and without it the localizing of a sound source would be far more uncertain than it is.

Diminishing the intensity of the sound until it was no longer perceived with closed ears, then opening the ears, was the plan adopted by Preyer. The decisions were very uncertain and incorrect. He considered the bone conduction from the meatus to be better than from other parts of the head, and hence this method only partly shut off factor of bone conduction.

Preyer wants more experiments in this series. It is likely that repeated practice would render better results. This is Preyer's theory, and there is no doubt something in it.

The chief fault I find is, that it is hard to believe that with errors of  $180^{\circ}$  in the median plane there can exist a special physiological mechanism for the appreciation of the direction of sound. This fault, however, may be simply due to lack of education of this special division of the organ of audition, this lack of education extending through generations.

Gruber, in 1869, expressed the opinion that the semicircular canals were not exclusively an organ of the sense of space, and was induced to believe that they were concerned rather in a participation of the hearing function. There can be no doubt, after Breuer's experiments and the results therefrom attained, that they are at any rate partially organs for the perception of our position in space and maintenance of our equilibrium, might they not be also organs for the proper projection of sound in space—organs for space perception in a double sense? Add to this the two factors of bone conduction and their existence as the main part of the hearing organ in fishes.

That the eyes assist in the appreciation of the direction of the sound there can be no doubt, and that they have filled up or

possibly have caused this deficiency in function of auditory projection is quite likely. Högyes holds there is a close connection between the eyes and the semicircular canals. He says he has demonstrated that a peculiar bilateral reflex connection exists between the muscles of the eye and the ampullary nerves, in conformity with which a reflex stimulus is transmitted by each labyrinth to certain muscles—from the left vestibular nerve to those turning the left eye upwards and outwards and rotating it inwards, and to those which turn the right eye downwards and inwards and rotate it outwards, the right vestibular nerve acting in exactly the opposite way.

H. von Kreiss has, during the past year, pursued a series of investigations much on the same plan as Preyer's. Judging that possibly some modification in the quality or intensity of a certain sound, according as it came from in front of or behind the head, would assist in localizing the source, Kriess varied the sound and also the distance from the head. He held that this modification in the quality or intensity could be learnt, and hence the projection would be really *per meatum* and fall under the category of the right-left theory. This power of localization from some modification he called "mediate localization." However, his experiments after this manner showed the uncertainty of median localization, as also the precaution with which the results must be judged.

Kriess conducted all his experiments in the median plane, holding that these points would be sufficient to prove the possibility of a special sound space mechanism, whereas the number of points examined by Preyer were only confusing. He used castanets and the telephone at a distance of twenty centimetres from the head. The antero-posterior differentiation varied greatly, but the superior-inferior was more accurate. Practice in some cases seemed to improve, in other cases to fail.

Kriess and his assistant projected almost always the posterior in front. In the posterior and inferior, both in front and behind, one-third were false. Kriess, to completely eliminate the factor of mediate localization, used seven different instruments, when, instead of producing a diminution of correct decisions, it caused

an increase. A slightly prolonged sound was more accurately projected than a short one.

Kriess considers the capability of a median projection cannot be doubted, and it depends on (1) practice, (2) the nature of the sound, and (3) some disposition. Among a number of persons he examined there was one who was absolutely correct even at different examinations, and this one had no special talent for music, so that any variation in tone might have assisted.

It was easier to distinguish change of direction if one sound was produced very shortly after the other, say half a second.

Another peculiarity is the decided tendency which exists for certain errors—*e.g.*, some people invariably project a sound from behind as coming from in front, and in front always correct, also *vice versa*. Again, in others the sound source is projected much higher than it really is, although this appeared by preference when the weak telephone click was used, and more rarely when the castanets were employed.

Kriess gathered from his investigations that an almost certain median localization (at least in so far as a decision of posterior from anterior) *can* occur under certain conditions—*i.e.*, if the sound stimulus from examination to examination is changed both in regard to its quality, intensity and distance. On the other hand, one cannot help but notice the extraordinary uncertainty which appears if the same localization and other conditions are imposed.

The theory of a mediate localization (*i.e.*, by the slight modifications of a sound arising from its position) receives a check, for it is the very opposite to find that the certainty of localization is favoured by altering the sound from time to time.

There are here two facts worthy of mention. 1st, One could decidedly speak of the indirect nature of median localization if the distinction of the location were positively decided by the nature of the chosen sound stimulus—*i.e.*, a weak sound projected by preference behind and a loud one in front. This did not occur in any of Kriess' cases. Only in one case were nearly all projections accurate, even after repeated investigations. From this, one might conclude that if a physiological mechanism existed

for the appreciation of sound direction, with it also the quality and intensity of the sound would come into consideration, and would be of influence in forming our decisions.

Just a few words now about the double direction perception.

Using two sounds of different quality, a sife note and a hissing sound, Kriess found both in front or both behind were correctly localized, but so soon as one was in front and the other behind, a degree of uncertainty appeared. The sife note behind and the noise in front were correctly, as a rule, distinguished; but with the sife in front and the noise behind, both were projected behind. There was no doubt but that the noise from behind interfered with the localization of the tones in front.

By the opposite arrangement the sounds were much more certainly projected, thus clearly proving the power of a double localization. The results varied greatly, but clearly showed, nevertheless, the existence of this power.

Of course all the foregoing experiments were performed on individuals with their eyes shut. The great fault I find with both Kriess' and Preyer's investigations is, that in their endeavours to develop a new theory, they seem entirely to have lost sight of the shape and position of auricle, which there is no denying greatly influences the projection of a sound source.

In my own investigations it became very evident, inasmuch that before beginning my work I could pretty clearly see where the greatest tendency to error would exist. As a test in my own work I used Politzer's acoumeter, which gives a short, sharp sound.

My experiments on cats and dogs I gave up as fruitless in one sense. One idea struck me that in animals with deficient accommodative power of the eye we find the auricle highly developed and very mobile, as in the horse, cat, dog, guinea-pig; in these animals the eye is markedly hyperopic, and for near objects the nose, as we continually see, is used as almost a third eye. On the other hand, in birds, where the accommodative power is more highly developed than in any of the vertebrata, being necessitated by their rapid flight, in these the auricles are absent, as also in aquatic animals.

In my own investigations the results were very variable, and only differed from those recounted above by the fact that I got a larger percentage of correct results. There were quite a number who, at any rate, at first projected the posterior sources most correctly, but these were generally endowed with auricles which were rather flatly applied to the head. Again, there was no doubt that the intellectual status had a good deal to do with the decisions. In those of rather dull mental condition, there was a hesitation generally terminating in a false statement.

Thinking and studying the matter well over, one can detect in all the theories some pretty big gaps. But just as the projection of an object to its correct position in space by the human eye brings into action many different factors, so I think the same holds good for the ear. For as in the eye an object makes itself perceived by stimulating the optic nerve, so in the ear the auditory nerve perceives the sound. The size and distance of an object is partly judged by the strain on accommodation by the projection of the two eyes and by experience.

In the ear the accommodation act is performed by the tensor tympani muscle, as Stricker, Hensen, Backendahl and Pollak have shown.

In the eye, we judge of the direction of an object by movement of the eye and the portion of the retina stimulated; in the ear we have not this, but we should reasonably look for a sound projection apparatus, and judging by the comparative anatomy of the fish, for instance, as already noted, it would lie in the semicircular canals or ampullæ, assisted also by the mental audition, as factors in the latter are the auricles, which I dilated on in treating of Kessel's theory, and also the walls of the meatus and membrana tympani, if one were to judge by the case of Charcot's already noticed, where, in anæsthesia of the walls of the meatus and tympanic membrane, the perception of the direction of sound was lost.

As a brief resumé, let me say—

1. The binaural audition plays the main part in our appreciation of the direction of a sound source, as evidenced in the elaboration of the right-left theory, with its modifications by

Kessel in regard to the function of the auricle, also possibly by the sensory state of the meatus wall. In this connection may be mentioned Münsterberg's oculo-aural theory. The failure of these theories is in connection with the projection of any source in the median plane.

2. To fill this gap, Preyer and Kriess brought out and elaborated the theory of projection by the ampullæ of the semicircular canals, which, judging by comparative anatomy, appears correct.

The fault here is that it is, as I have already said, hard to believe an error of  $180^\circ$  possible with the existence of a physiological mechanism for the appreciation of direction; but against this we have to put those cases where the projection was accurate, also some possible weakness of discrimination or lack of attention. It is likely that through lack of use or education the organ has never assumed its full function.

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## APPENDICITIS—OPERATION—DEATH ON THE TENTH DAY.

BY GEO. E. ARMSTRONG, M.D.,

Instructor in Surgery, McGill University; Surgeon to Montreal General Hospital.

F. S., aged 30, consulted me about April 15th for a chronic, persistent diarrhoea, from which he said he had suffered for about fifteen years. Loose, watery, mucus stools; colicky pains, and also a pain in right hypochondriac region. He had previously been under my care for diarrhoea in 1884 and 1885. For about six years I had not seen him.

On examination, I found the abdomen flaccid and compressible over the left two-thirds. The right third was tender and painful, and a hard, well-defined mass could be distinctly outlined in region of ascending colon. Pain first felt at beginning of year. I advised him to enter the Montreal General Hospital with the view of having further advice, possibly an exploratory incision. Has lost 13 lbs. in weight since January, 1891. During the next two weeks the condition of the right side changed very much. There evidently had started up a fresh and active inflammatory process; so much so that when seen in consultation

by Drs. Geo. Ross and Shepherd on his admission to hospital the right side of abdomen and right lumbar region were so tender that anything like a satisfactory physical examination without an anæsthetic was out of the question. He walked with difficulty. He was considerably emaciated. Had never been confined to bed. He was a printer by trade. Had inflammation of lungs and scarlatina in childhood. Father died of gout at age of 69; mother and one sister and one brother are alive and well.

On the 1st May, 1891, assisted by Dr. Shepherd, I made a lateral incision on the right side, over the tumour. On entering the peritoneal cavity I was for some minutes puzzled to make out what the condition of things was that I was to deal with. In the iliac region the omentum was closely adherent to the parietal peritoneum to the right of the cæcum and below. Above I could pass my finger around into the right loin and determine that the kidney was normally placed and not adherent to the tumour. The liver and gall-bladder could be also excluded. I then carefully separated the omentum from the parietal peritoneum to the right of and below the cæcum. The walls of the cæcum were thickened and covered with inflammatory tissue. The appendix was with difficulty recognized, as its walls were extremely thickened and œdematous, and its base of attachment to cæcum fully one and a half inches broad. I now carefully separated the adhesions on the right side of the cæcum which bound it down to the iliac fossa, when I came upon a sac whose anterior wall seemed to be made up of purely inflammatory tissue. Fluctuation in this sac was obtained, the needle of a large hypodermic syringe introduced, and thick pus withdrawn. I then enlarged the opening and evacuated nearly a pint of thick pus having a distinctly fæcal odour. On exploring this cavity it was found to extend downwards below Poupart's ligament, and above as far up as the diaphragm. The cavity was thoroughly irrigated with boiled water and two rubber drainage tubes inserted, one reaching to the upper and one to the lower limit of the sac. The abdominal wound was then closed with silkworm gut sutures.

On dressing the wound on the third day gas was noticed escaping, and on the fourth day fæcal matter escaped.

On the sixth day there occurred a marked elevation of temperature, and on examination of lungs, percussion dulness was found over right apex, extending down as low as lower border of third rib. There was increase of vocal fremitus, and loud coarse mucus râles were heard over this area.

Death occurred on the tenth day after operation.

This case has many features of unusual interest; in some respects resembling a case reported by Dr. William Gardner. I am not at all sure that the case can correctly be entitled one of appendicitis. I regret that no autopsy was obtained to clear up the case. The history is rather one of chronic colitis, probably tubercular. There is no history of a recurring subacute appendicitis, much less of an acute attack. *He had never been confined to his bed before admission to hospital.* At the operation the appendix was not, apparently, more involved than the posterior wall of colon. The pus was entirely retro-peritoneal. I think it quite likely that tubercular ulceration took place in the cæcum or appendix, or both; that there was excited in their peritoneal coverings an inflammatory action that resulted in the union of the vesical peritoneum of the cæcum or appendix with the parietal peritoneum beneath. The ulcerative action continuing, perforation occurred, and escape of pus or possibly a small amount of fæcal matter into the subperitoneal tissue, where suppuration continued until the large cavity described above was formed.

## Retrospect Department.

### QUARTERLY RETROSPECT OF SURGERY.

BY FRANCIS J. SHEPHERD, M.D., C.M., M.R.C.S., ENG.

Surgeon to the Montreal General Hospital; Professor of Anatomy and Lecturer on Operative Surgery, McGill University.

*Excision of the Tongue.*—At the meeting of the London Medical Society, held April 2nd, 1891, Mr. W. Whitehead of Manchester read a most instructive and interesting “report of 104 Cases of Entire Excision of the Tongue for Cancer” (*Lancet*, May 9th, 1891). During the last twenty years he had operated 139 times on the tongue for cancer, with 119 recoveries and 20 deaths, a mortality of 14.3 per cent. Deducting 10 removals with the galvano-écraseur and 25 partial excisions, there are left 104 cases of complete excision of the tongue with scissors, with a mortality of 20, or 19.21 per cent. Of course these cases include those where the disease was extensive, involving the floor of mouth and tonsil, and necessitating an extensive and severe operation, the mortality of which was about 50 per cent. In 66 cases where the tongue alone was removed, the mortality was only 4.5 per cent. Mr. Whitehead describes his method of operating as follows :

(1) The patient should be completely under the influence of the anæsthetic during the first stage of the operation, but afterwards only partial insensibility should be maintained.

(2) The head should be supported in such a position that the blood should gravitate out of the mouth rather than back to the pharynx.

(4) A firm ligature should be passed through the tip of the tongue for purposes of traction.

(5) The first step in the operation consists in dividing the reflection of mucous membrane between the tongue and jaw and the anterior pillars of the fauces.

(6) Rapid separation of the anterior portion of the tongue from the floor of the mouth, and (7) securing, if possible, the lingual arteries with forceps prior to division.

(8) Passing a ligature through the glosso-epiglottidean fold before finally separating the tongue.

(9) The application of a mercurial solution to the floor of the mouth, followed by painting the surface with an iodoform styptic varnish.

With regard to hemorrhage, Mr. Whitehead states that after the mucous membrane and pillars of the fauces are cut, the tongue can be drawn out of the mouth, making the operation an external one, and if the arteries are cut before being seized they bleed externally. He, from extended practice, can now always seize the arteries before division, and he is in the habit of disregarding all bleeding and cutting boldly until the neighbourhood of the arteries is reached. He always twists the vessels, and has never had a case of secondary hemorrhage. In his own practice the operation is practically bloodless. As a styptic and antiseptic paint for the floor of the mouth, he uses Friar's balsam, but substitutes for the spirit ordinarily used in its preparation a saturated ethereal solution of iodoform, adding to the ether one volume in ten of turpentine. He at one time fed patient by the rectum for the first four days, but now he has abandoned this practice and feeds patient by the mouth as freely and early as possible. Instead of keeping his patients in bed, he encourages them to sit up and even go out in the sunshine the day after the operation if the weather be fine.

In sixty-one cases which could be traced after operation, 15 survived the operation one year, 4 two years, 2 three years, and 1 six years. In one case reported in 1880, the patient lived fourteen years after operation. In only six cases was there a family history of cancer, and in seven of syphilis. In 16 cases the disease was traced to an injury. Of 79 cases, 41 smoked clay pipes. In the 15 cases occurring in women, two occurred in smokers. Mr. Whitehead pleads strongly for early operation.

I have recently performed this operation in a man aged 63. It is easy, simple and rapid, and with a good light and sharp assistant the arteries need not give the operator any anxiety. The patient swallowed liquid food readily on the second day, and was up and about on the third. After food was taken, the wound was washed out and the styptic varnish applied twice daily. In every way I found the operation to be a most satis-

factory one, when the floor of mouth, tonsils or glands are not involved.

Mr. Berger of Paris, at the meeting of the Société de Chirurgie on February 4th, 1891 (*La Semaine Médicale*, Feb. 11th, 1891), recommends in partial excision of the tongue the union of the cut edges by deep sutures. He has obtained in these cases complete union by primary intention in two weeks. The tongue is removed by means of the thermo-cautery, and the most careful antiseptic precautions are taken, the mouth being washed out every four hours with a boracic acid solution.

After complete excision of the tongue, some surgeons recommend the bringing of mucous membrane from before backwards over the stump, as is done in cases where the jaw is removed. Whitehead has found this procedure interfere with the movements of the epiglottis. In cases where the disease of the floor of the mouth is extensive, it is quite impracticable.

*Treatment of Gangrenous Gut in Strangulated Hernia.*—Although this subject has been referred to very recently, still the opinion of surgeons is so various that any further light on the subject will prove most acceptable.

Mr. C. B. Lockwood, at a meeting of the Royal Medical and Chirurgical Society, held March 24th, 1891, read a paper on the *Treatment of Strangulated Hernia when the Intestine is Gangrenous or Ulcerated*. He showed that the old treatment could not be depended upon to give relief. In the cases operated on by incision of the gangrenous bowel, no less than 88.57 per cent. died. Even if the patient escapes the dangers of septic infection, the bowel may be opened so high up that he afterwards dies of inanition. The author's conclusion was that primary resection and suture was the procedure that ought to be adopted in all these cases.

In the discussion which followed, Mr. Mayo Robson advocated primary resection, and related two successful cases. Mr. Thos. Bryant was surprised at the great mortality of the old operation. In his experience the majority of cases were moribund before they were operated upon; patients in his experience did not die from faecal extravasation or peritonitis, but from collapse. He held that the treatment by resection could be applied to a very

small number of cases, and that for the majority the old treatment would be adhered to. Mr. Bennett looked upon the treatment by resection as the ideal one, but such a treatment was not always easily adapted to ordinary practice. The condition of the patient also often was such that the question of resection could not be considered. In many cases where the bowel was laid open there was paralysis, and resection even would not overcome this. He had succeeded in affording relief by introducing a tube and drawing off the fæces. He advocated returning the gut within the neck of the sac and introducing a drainage-tube. Mr. Treves stated that the mortality after the operation for strangulated hernia in the London Hospital was 50 per cent. In 73 cases of strangulated hernia in which he had operated when emergency surgeon, there were six cases of gangrene of the bowel; all died. In two he did nothing, in one he cut open the bowel, and in three he resected. The less that was done in these cases the better; the patients died of obstruction and not of gangrene. The sac should be opened, the constriction relieved, and the gut opened or left to open itself.

In the *Beitrag zur Klin. Chir.*, Bd. vii, Hft. 1, Dr. Krumm of Heidelberg discusses the indications and contraindications of primary resection with apposition of the divided portions of intestine by circular suture in cases of gangrenous hernia. The paper is based on 15 cases of gangrenous hernia treated in Prof. Czerny's clinic in seventeen years. In 9 an artificial anus was established, and in 4 the gangrenous intestine was cut away and the divided ends of the canal brought together by a circular row of sutures. By the first method 5 cases recovered completely, and 4 resulted fatally. Primary resection was successful in three cases, the fourth case dying asphyxiated on the operating table. Czerny advocates resection in suitable conditions, but the formation of an artificial anus is indicated when the gangrene involves the sac as well as the bowel, when the strangulation has been much prolonged and the patient is in a state of collapse, and there is a large accumulation of fæces in the intestinal canal. Primary resection is justifiable in recent cases of strangulation, where the mesentery is not too much constricted or involved,

and where there is no exhaustion and collapse, and no peritonitis. It is contraindicated where there is a phlegmon. Dr. Krumm suggests that this operation be confined to hospital practice.

*Resection of Intestine by Senn's Method.*—At a meeting of the Clinical Society of London, held May 8th, 1891, Mr. A. Lane reported two cases of resection of the gut for gangrene. The first case was that of a woman aged 53. It was femoral, and on the right side. The bowel was found in a damaged condition, so after cleansing the bowel, a median section was made, the bowel drawn out, and it was found that only a portion of the calibre of the bowel was involved (Littré's hernia), and that its condition was hopeless. About three inches of the bowel was removed and its mesentery ligatured, the cut ends were inverted and closed by Lembert's suture, and anastomosis performed by Senn's plates. Patient did well, and in twenty-four days went out well. The second case was a woman, aged 55, who had suffered from strangulated femoral hernia for five days before admission to hospital, was in a collapsed condition, and abdomen distended. The bowel was found gangrenous, and some four inches was removed. The operation was very rapidly performed owing to the condition of the patient. She lived five days, death resulting from the escape of contents into the peritoneum from a small opening in the proximal end of the bowel. Mr. Lane, in conclusion, strongly advocated, in desperate cases, merely performing Senn's anastomosis without resecting the bowel, but leaving it outside. In cases where the condition of the patient was fair and the bowel doubtful, the abdomen should be opened in the middle line, the bowel examined, and, if necessary, resected. He looked upon the old method of treatment as a disgrace to modern surgery.

In the discussion which followed, the majority of speakers advocated resection. Mr. Parkin stated that in 272 operations for strangulated hernia at Guy's Hospital there were 79 deaths. In 22 cases where the bowel was gangrenous, 21 died. Mr. Harrison Cripps protested against the older methods being called barbarous, and held that much could be done by opening the bowel and withdrawing the contents by means of a tube. If the

patient were moribund, resection of the intestines would prove of no avail.

*Diaphragmatic Hernia.*—Dr. Hollis (*Lancet*, May 16th, '91) reports a case of this hernia occurring on the right side in a boy aged 16, admitted into the Sussex County Hospital. Three hours before admission he was found lying in the street doubled up with pain; he had been perfectly healthy up to the time of seizure. On admission he was in a state of collapse. His bowels had been opened that morning previous to onset of pain, which was of a dull, aching character. Heart's apex two inches outside of nipple line; sub-tympanic percussion note over the right side of chest, suggesting pneumothorax; breath sounds were distant and cavernous; absolute loss of vocal fremitus as high as scapula; abdomen retracted and percussion note dull. He continued to get worse, and it was decided to aspirate, but nothing at first came through the needle, but after cleaning it a bluish fluid and air escaped. The fluid had a grumous smell like stomach washings, was strongly acid, and found to contain oil globules, starch granules, muscular fibres, etc. He was much relieved for a time, but the pain again returned, and he died that evening. At the necropsy, the right lung was found collapsed, and the right chest contained omentum, mesentery, large and small bowel; these protruded through a round opening with a smooth edge, which existed between the external arched ligament and the central tendon of the diaphragm. All the intestines, with the exception of the duodenum, sigmoid flexure, and rectum were in the right thorax. The stomach was much congested and ecchymosed, and had without doubt been in the thorax when it was aspirated. The opening in the diaphragm showed no evidence of recent rupture.

*Herniæ which have Relapsed after Operation.*—Dr. Wm. T. Bull, in a paper on the above subject (*N. Y. Medical Journal*, May 30th, 1891), says that frequent contact with patients who have been operated on for herniæ gives rise to the belief that the majority, while not cured, are certainly improved. This goes without saying in the cases of irreducible or strangulated herniæ. Even with relapsed hernia, patients find much satisfaction in the fact that the protrusions are not so large as before

operation, or they experience increased comfort and security in the wearing of the truss. When the patient says his condition is worse than before operation, it is found that a truss has not been worn at all or that the cicatrices of the wounds presented signs of their having healed by granulations with subsequent yielding of the cicatrices. In conclusion, he says that he believes that all procedures should be so devised as to insure prompt healing of the wound, and that the support of a truss should be insisted on from the time the patient leaves his bed.

*Operations on Enlarged Prostate.*—Dr. Belfield of Chicago (*Amer. Jour. of Med. Sc.*, Nov. 1890), in an elaborate article on the above subject, says—(1) The inability to evacuate the urine does not depend on degeneration of bladder muscles, but is due to mechanical obstruction offered by prostatic growths.

(2) That this enlargement of the prostate is not limited to advanced life.

(3) That prostatic obstruction is usually of such a form as to permit of excision.

When operation is determined upon, thorough enucleation of all circumscribed masses within as well as above the general prostatic service should be done. Such tumors can be enucleated after incision of the mucous membrane with surprising facility. In very feeble patients, perineal prostatectomy should alone be practised; in others, in proportion, cystotomy should be done. In conclusion, the author strongly advocates an earlier resort to operation, and says that it should not, as hitherto, be deferred until the last stage. The reader is also referred to the following articles:—

“La Prostatotomie et la Prostatectomie,” by Prof. A. Heydenrich. (*La Semaine Médicale*, No. 49, Nov. 12th, 1890.)

“Prostotomy and Prostotectomy, and the Indications for their Performance,” by Dr. Ed. Vignard of Paris. (Quoted from *Central. f. Chir.*, No. 32, 1890, in the *Annals of Surgery*, Feb. 1891.)

“Lateral Prostatectomy,” by Prof. Dittel. (Quoted in the *Annals of Surgery*, Feb. 1891, from the *Wien. Med. Woch.*, Nos 18-19, 1890.)

*Litholapaxy in Children.*—At a meeting of the Medical Society of London, March 16, 1891, Mr. Edmund Owen reported a fatal case of rupture of a boy's bladder during the performance of litholapaxy. The patient was an unhealthy child under five years of age. In washing out the bladder with a wash bottle of the size used in adults, a gurgle was heard and all resistance to the flow through the evacuator ceased. An immediate median abdominal section was made, the rent in the bladder (one-eighth of an inch) closed, and the abdominal wound sutured. A perineal drain was also introduced. The boy died of collapse in eight hours.

At the same meeting Surgeon-Major Keegan read a paper on *Litholapaxy in Children*, which he illustrated by various specimens and instruments. The collection of stones showed 117 specimens out of 125 litholapaxies performed in males under 15 years; the oldest patient was 14 years, the youngest 21 months—average 6.38 years. There were four fatal cases, and in each case there was organic disease of the kidneys; there was but one recurrence in the series. He preferred this operation to the lateral or median for two reasons: (1) The rapidity of cure, and (2) the freedom from the objections and dangers inherent in all surgical operations in which the knife was used. He did not advise the operation in young males with large, hard calculi unless the operator has had considerable experience. He held that no surgeon should attempt to perform litholapaxy on a child trusting to one lithotrite and one evacuating catheter, for a lithotrite that would pass easily into a boy's bladder at the beginning of an operation might not do so towards its termination, when the urethra had, perchance, become swollen and encysted. He said that four to five ounces of water should be the maximum quantity in the bladder at any given moment, injections never being practised while the patient was straining; that extreme gentleness and care should be taken in practising all manipulations in the bladder and urethra, and that it should be ascertained that not a grain of debris was left behind in the bladder.

*Forty successful cases of Litholapaxy in Boys.*—Surgeon-Major Gimlette reports forty cases of litholapaxy in boys from

the age of 3-16 years (*Brit. Medical Jour.*, 9th May, 1891). He says that in the vast majority of cases the operation was followed by immediate relief without anything more than a trifling rise of temperature. The boy, if allowed, would be up and playing about in two or three days. In a few cases fever ensued, always intermittent, never high, and yielding to quinine. He reports, in addition, six cases where litholapaxy was impracticable owing to the small size of the urethra, sacculated bladder, size and hardness of stone, etc. Two of these cases died.

Surgeon-Major Freyer, in a paper entitled *The Present Position and Scope of Litholapaxy*, gives the following statistics (*Brit. Med. Jour.*, May 9th, 1891). In 1886 he gave the results of 321 operations for stone in the bladder, 128 litholapaxies, and 193 lithotomies, with 14 deaths. He showed that the introduction of the operation of litholapaxy had the effect, in his practice, of reducing the mortality from 18 to  $5\frac{3}{4}$  per cent. Since then he has given a further series of 400 cases of stone, 342 litholapaxies with four deaths, 54 perineal lithotomies with one death, and 4 supra-pubic operations with one death,—in all 400 operations with six deaths, a mortality of  $1\frac{1}{2}$  per cent. He attributes this lessened mortality entirely to the introduction of Bigelow's operation. Of the 342 cases of litholapaxy 115 were in male children.

In the same number of the *British Medical Journal* are two papers, to which the reader is referred, viz., (1) *Remarks on Suprapubic and Lateral Lithotomy and on Litholapaxy*, by J. A. Cunningham, M.D. (2) *Observations on Lithotrity with a series of forty consecutive cases*, by F. S. Edwards, F.R.C.S.

*Re-implantation of Bone in Trephining*.—Dr. R. F. Weir exhibited a case of trephining to the New York Academy of Medicine (*N.Y. Med. Jour.*, May 16th, 1891), where he successfully replaced three large bone discs which had been removed in a case of depressed fracture received many years before, and which had produced epilepsy. The case was operated on in 1887, and the replaced bones were still firm and only recently had slight pulsation at the spot appeared. The whole surface of bone was somewhat sunken, though smooth, no trace of joining being felt. He mentioned another case of re-implantation of the

discs where they remained quite solid for two years and then gradually disappeared, absorption having taken place, and a hernia of brain substance covered by skin took place. In neoplasm this absorption acts as a valuable safety-valve, and relieves intracranial pressure. In replacing the bone removed by the trephine, the pieces must touch the margins of the cranial opening, and the little pieces filling up the gaps must touch one another.

*The Closing of Trephine Openings by Celluloid Plates.*—

A case was presented to the Vienna Medical Society by Hintersoisser (*Wiener Med. Presse*, No. 42, Bd. xxxi) showing the successful result of an effort to close a trephine opening by a celluloid plate. The patient, some months after recovering from a comminuted fracture of the left parietal bone, suffered from giddiness, weakness, loss of power in the right side, and chronic twitchings of the right facial region and the corresponding upper extremity. Three years later epilepsy developed. Examination showed a hyperæsthetic depressed cicatrix corresponding to the position of the upper portion of the ascending parietal convolution. There was also bilateral concentric narrowing of the field of vision, diplopia on looking to the left, and sensory and motor paresis of the left side. The cicatrix was excised, a periosteal flap raised, the depressed bone removed, and the healthy non-adherent dura incised, showing normal brain cortex. The dura was sutured; on the fourth day it was found united. A polished celluloid plate was now fitted over the trephine opening, the periosteum was stitched over this, and finally the skin wound was sutured. Healing was prompt and all brain symptoms ceased. Two other successful cases were also reported where celluloid plates were used in a similar manner.—(Quoted in *Amer. Jour. Med. Sc.*, June, 1891.)

*Successful Trephining for Traumatic Rupture of the Middle Meningeal Artery.*—Dr. Rochet (*Gaz. Hebdomadaire de Med. et de Chir.*, Dec. 27th, 1890) reports a case where a man, aged 28, was thrown violently on the ground, striking on the right parietal protuberance; he was carried in an unconscious condition to a house, where he remained twenty-four hours, and was then removed to hospital. When seen he was like a person in a deep

sleep, though when spoken to he would open his eyes, but made no response. There was no paralysis, no discharge from ears, or pressure over the parietal region; he made grimaces; ecchymosis of both eyelids, of the zygomatic region, and temporal fossa. On the third day facial paralysis began, with conjugate deviation of the eyes; the left arm was completely, and the left thigh and leg partially, paralyzed; right pupil dilated, and right cornea almost insensible. On the fourth day, when asked where he suffered, he pointed to right side of head; in the night he was crying, and tried to rise. He remained thus for five days, and then surgical interference was decided upon. A crucial incision was made over the right fissure of Rolando, and on throwing back the flap a long line of fracture was seen crossing the parietal bone. A trephine was applied where the fracture crossed the line of the Rolandic fissure, and on removing the bone there was a jet of black blood. The orifice was enlarged and a large clot found, which was removed, leaving a cavity the size of an orange occupying all the temporo-parieto-occipital region. The cavity was washed with boric acid solution and gently packed with iodoform gauze. No sutures were taken in the scalp. During the evening the patient recovered consciousness and the hemiplegia was greatly improved. Next day the facial paralysis disappeared, and ultimately the patient entirely recovered.—(*N. Y. Med. Journal*, April 25th, 1891).

*Results of Arthrectomies of the Knee.*—Dr. Angerer of Munich has performed 82 arthrectomies during the last four years in the polyclinic and children's clinic; 63 of these were children under 14 years of age. Angerer concludes from his observation of these cases that there is little danger in overlooking foci of disease which may cause subsequent trouble. Of 70 cases operated on, primary union was obtained in 48; 10 of these cases were marked by a return of the disease *in loco*, 8 of these were cured by treatment of the fistula. The author prefers arthrectomy to typical resection, especially in the synovial form of tuberculosis. A bony focus of disease was found in 52 of the 82 arthrectomies; 30 were cases of synovial tuberculosis. In 63 arthrectomies in children, a disease focus was found in 36. The author recommends early movements and massage in order to avoid contrac-

tures, and also advocates early operation.—(Quoted in *Annals of Surgery*, vol. xii, p. 469.)

*Arthrectomy of Ankle-joint with temporary removal of Astragalus.*—Dr. H. Ström of Norway extirpated the left ankle-joint in a boy aged 15, who was suffering from tuberculosis of this joint. He opened the joint by means of Kocher's method. As he could not gain sufficient access to the tuberculous masses which he intended to extirpate, he removed the astragalus, and after having carefully extirpated the tuberculous tissue, replaced it again. All the cartilaginous surfaces of the tibia, fibula, calcaneum, scaphoid and astragalus were removed. The cutaneous wound was brought together and drainage-tubes inserted. The patient was exhibited to the Christiana Medical Society, Dec. 20th, 1889, at which time he was practically cured. The foot was swollen, but he could stand on it well.—(Quoted in *Annals of Surgery*, vol. xxii, p. 470.)

*Surgery of the Liver.*—Mr. Knowsley Thornton, in a most interesting paper on *Observations on Additional Cases illustrating Hepatic Surgery* (*Lancet*, April 4th and 11th, 1891), details notes of 16 cases in which he has operated. He expected to find gallstones in ten, and found them in seven. In one case, although the gallstone was there, he failed to find it; in another, the case proved to be one of hydatids. In three cases which he explored, two proved to be malignant disease, as he expected, and in the third there were merely adhesions, the division of which cured the patient. The diagnosis of gallstone is still uncertain, and Mr. Thornton advocates more frequent exploration. The chief diagnostic points regarding the diagnosis of gallstones, he says, are: (1) The sudden onset of the pain and the equally sudden departure. (2) The way in which the pain travels round the body and through into the back at the angle of the scapula, and the sense of constriction round the region of the diaphragm. (3) The presence of a mobile pear-shaped tumor in the situation of the gall-bladder, or to one or other side of that situation, which rises and falls with respiration, and varies in size and tension. If the above symptoms be suddenly complicated with jaundice, especially if a swelling previously present disappears, it is pretty certain that the stone has passed through the cystic duct

and become impacted in the common duct. Absence of ascitic fluid cannot be relied on as a differential diagnosis between malignant disease and gallstones, for gallstone may be present with malignant disease. He advocates needling the stones when arrested in the common duct, and leaving the fragments to find their way into the bowel. To obtain success by this method, the stones must not be too large and they must be mobile. When large stones are impacted in the common duct, the duct should be opened, the stone removed, and the opening sutured. In cases where the gall-bladder cannot be sutured to the abdominal wound, or the incision in the common duct is imperfectly closed, Mr. Thornton has proved by cases that if efficient drainage is provided the cases will do well. In such conditions he advises, in addition to the drainage tube put into the gall-bladder, that a counter opening be made above the pubes and a glass-tube placed in the pouch of Douglas.

*Rupture of the Gall-bladder.*—Mr. W. A. Lane (*Lancet*, May 16th, 1891) relates a case where there was rupture of the gall-bladder with retention of a considerable quantity of bile in the peritoneal cavity for five weeks, in which operation proved successful. The patient was a boy, aged 18 years, who was brought to the hospital in a moribund condition, with the history of a blow on the abdomen five weeks before. The abdomen was very distended, and contained a quantity of fluid. Immediate laparotomy was performed without much hope of success. About three gallons of fluid, deeply stained with bile, were removed. A drain was introduced, and after twenty-four hours, as no more fluid escaped, it was removed. He rapidly improved, but about a week or two later a dulness appeared in the position of the liver, which gradually extended for a considerable distance into the right chest, and downwards into the umbilicus. Aspiration removed six pints of bile, so an incision was made later and the finger introduced into what was apparently an adherent gall-bladder. A drain was introduced, which, on ceasing to evacuate bile, was removed a week later. The boy rapidly got strong, and gained flesh.

Mr. Lane says that the fact that a considerable quantity of bile may remain free in the abdominal cavity for five weeks and

produce no symptoms other than those of a serous effusion will give the surgeon much more courage in interfering with abnormal conditions of the gall-bladder and bile ducts, for previously this condition was dreaded from the fear of imaginary risks involved. According to Dr. Pavy, no harm results from the escape of even a considerable quantity of bile into the peritoneal cavity in dogs and rabbits.

*The Treatment of Malignant Growths of the Thigh by Hip-joint Amputations.*—In an editorial in the *University Medical Magazine*, January 1891, this subject, which has interested surgeons for some time past, is considered. Borck (*Deutsch. Med. Zeit.*, Nov. 24, 1890) states that in nine cases a hip-joint amputation was performed for the relief of a malignant growth of the thigh with the following result: One died as a result of the operation, seven subsequently died from a return of the disease, and but one remained cured. In 111 cases collected by Borck from medical literature, 23 died from the operation. In only 36 of the remaining cases could the history be followed; of these, 26 died from metastasis, 6 from consumption or other disorder frequently associated with malignant growths, 2 suffer from tumors, 1 is still well two and a half years after operation, and 1 is well thirteen years after. Again, Borck states that as a result of the study of 87 cases of hip-joint amputation, in which full histories could be obtained, there is not a single instance of assured permanent cure. These statistics are interesting in view of the advice of some surgeons that in all cases of sarcomatous disease of the thigh amputation through the hip-joint should be performed. This procedure does not prevent recurrence, and in view of the fact that the operation is in itself more dangerous than a simple amputation of the thigh, it would be as well to discountenance a practice the benefits to be derived from which are founded on theoretical grounds alone.

I have at present a patient who had sarcoma of the lower third of the thigh, and for which I amputated through the junction of the upper and middle third two years ago; she still remains well and having no symptoms of recurrence. It would be interesting if Borck would tabulate statistics of cases of ma-

lignant disease of the thigh in which amputation was performed below the hip-joint.

*Extirpation of Syphilitic Stricture of the Rectum.*—M. Quenu has put on record (*Bulletin de la Société de Chirurgie de Paris*, No. 3, 1891) a case of very tight syphilitic stricture of the rectum in a woman aged 36 years, in which, by the posterior median incision, he excised the lower extremity of the gut, together with the surrounding indurated tissues. The patient made a good recovery, and when last seen (seven months from date of operation) was quite well and presented no signs of relapse. Simple dilatation in cases of old syphilitic disease of the rectum Quenu believes to be often ineffectual, usually very painful in practice, and not always free from risk. Posterior linear rectotomy sometimes gives better results, but is merely a palliative operation, and is sometimes followed by long-continued and exhausting suppuration. The disease, when of long standing, should be treated as a new growth, and if the stricture involve the lower portion of the rectum, excision should be performed by the perineum; and if it be situated above this region, the sacral method of Kraske should be employed.—(Quoted in *Brit. Med. Journal Supplement*, May 2nd, 1891.)

*Results of Excision of Chancre.*—Dr. Jullien (*Annales des Maladies des Organes Genito-Urinaires*, April 1891) records the results of the operation in eighteen cases, and contends that his results are such as to lead him to continue the plan. In itself the operation is simple enough, and the wound usually heals by first intention. Only on four occasions in the eighteen cases has the induration returned, and in no single instance has it been attended with ulceration. In two cases the chancres reappeared. In a considerable number of cases no constitutional symptoms followed, and Dr. Jullien considers that when induration is quite recent, and when there is no affection of the glands or lymphatics, the operation should be undertaken, and will in a fair number of cases yield a satisfactory result.—(Quoted in *Brit. Med. Jour. Supplement*, May 2, 1891.)

*Intubation versus Tracheotomy.*—Dr. W. H. Whyte (*North American Practitioner*, March 1891) does not believe that the

hope has been fulfilled that intubation would, on account of its simplicity, take the place of the knife and add materially to the resources of the profession. The operation requires a degree of manual dexterity which the average physician, with his few opportunities, is not able to acquire. The objection is that the patient is subjected to a certain amount of exhaustion which can be ill borne in one suffering from diphtheria. He thinks one cause of death after intubation has not been given sufficient prominence—viz., pneumonia, resulting from the entrance of liquids at the air passages. The great advantage possessed by tracheotomy over intubation is that the surgeon or nurse can easily remove and replace the tube without pain or discomfort to the patient. He thinks country practitioners do not perform tracheotomy early or often enough; it is an operation which any country practitioner with a cool head and some surgical experience can perform.

*Two Cases of Dislocation of the Ulnar Nerve.*—These two cases were treated at St. Thomas's Hospital, London. The first, under the care of Mr. Croft, was a woman aged 28, and the accident was caused by a fall on the elbow. There was pain in the inside of the elbow extending to the fingers whenever she flexed the arm, caused by the ulnar nerve slipping over the internal condyle when the elbow was near a right angle. There was no local tenderness, loss of power or sensation, or wasting of the muscles. The nerve was exposed by a semilunar incision and the nerve sheath stitched to the inner margin of the triceps tendon, and he finally attached the edge of the muscle to the periosteum covering the internal condyle, thus embedding the nerve. The arm was then fixed in the extended position. The day after there was numbness, and, later, absence of sensation in the fifth finger. The wound healed by first intention and sensation gradually returned. On discharge from hospital there was no pain on flexion, and the function of the nerve was completely restored. The second case was a man aged 30, a book-keeper, with much writing to do, and for the last two years he found his arm getting weaker, preventing him from holding a pen for any length of time. He noticed that something slipped forwards on the inner side of the elbow. There was no history of injury. The patient

was operated on by Sir Wm. MacCormac. The nerve was exposed and fixed by two kangaroo tendon loops passed through the inner margin of the triceps tendon and somewhat loosely round the nerve. The arm was extended. There was no loss of sensation, and on discharge from hospital the nerve was quite fixed in its normal position, and the patient could write fairly well.—(*Lancet Hospital Mirror*, May 9th, 1891.)

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## QUARTERLY RETROSPECT OF GYNÆCOLOGY.

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*Treatment of Fibroid Tumors of the Uterus after the Method of Dr. Apostoli*, by Dr. JOHN HOMANS, of Boston.—Dr. Homans gives a resumé of thirty-five cases treated by electrolysis. In the majority of these cases Dr. Homans has received a reply from a circular sent to them in regard to their state of health at the time of receiving the circular. The tenor of the majority of the replies was to the effect that the tumor had increased in size and the symptoms had become steadily aggravated in severity.

Dr. Homans concludes in the following way:—"In only two of the cases has the size of the tumor been diminished, and these two are cases when the menopause has occurred soon after the treatment *à la* Apostoli. *The general health* has been improved in fifteen cases; has been made worse in two, and death has resulted from the treatment in one. *Profuse hemorrhage* has been diminished to a normal or bearable degree in nine; has been increased in six and unchanged in nine cases. *Locomotion* has been made easier in sixteen cases and more tiresome in five. *Pain* was lessened in six cases, increased in two and unaffected in five; in sixteen it was not present. *Menopause* has occurred in four cases since the treatment begun. From this review it will be seen that we may expect, in the majority of cases, that the general health will be improved; that hemorrhage will be diminished; that locomotion will be made easier, and pain will be lessened; but we must almost never expect diminution in the size of the tumor, and seldom its arrest of growth. Out of thirty-six

cases, ten increased in size, and sixteen remained the same, but the latter were growing very slowly if at all."

I have learned enough about the treatment *à la* Apostoli to know that its results are not certain enough to induce me to pursue it as a routine treatment, and that it is occasionally fatal—through the fault of the surgeon, if you please, I am willing to admit, but, still once in a while fatal. If the practice of a method to be efficient and harmless requires the presence of the inventor, as well as his apparatus, then its beneficial effects can only be experienced in the presence of the inventor, and patients must go to him. Such a method can hardly be of general use.

Dr. Bigelow's lithocapaxy, for instance, can be practiced by any intelligent, practical and competent surgeon with almost as good results as if practiced by Dr. Bigelow himself; but electrolysis for fibroids *à la* Apostoli has not been as encouraging. efficient and harmless in my hands as Dr. Apostoli's books would lead me to suppose it ought to be. I have hardly used my battery during the past year.

*Diagnosis of Pelvic Inflammation in the Female* is the title of an address delivered before the British Medical Association by Dr. CHARLES J. CULLINGWORTH, of London. He said:—

"By pelvic inflammations I mean pelvic peritonitis and pelvic cellulitis, and not inflammation of the various viscera contained in the pelvis. These latter will only be dealt with so far as they are concerned in the pathological processes that lead to the affections I have just named.

"Is it possible clinically to distinguish between inflammation of the pelvic peritoneum and inflammation of the pelvic connective tissue? I believe that in most cases it is. The diagnosis is undoubtedly beset with difficulties, and, in the present state of our knowledge, there are still some cases where it is impossible. Year by year, however, their number is diminishing. Our knowledge of the anatomy of the female pelvis is becoming, chiefly from the study of frozen sections, more precise, while, owing to the advance in abdominal surgery, our opportunities of comparing the physical signs with the actual conditions are much more frequent than they ever were before. Exploration of the pelvis by abdominal section, now so frequently practiced, is teaching us on the living subject, and, therefore, under far more favorable conditions, the

lessons that until within recent years we could only learn from an occasional post mortem examination, performed, not only when the disease had advanced too far to teach us anything of its earlier stages, but also when the parts had ceased, from their loss of vital tonicity, to hold the same relative position to each other, and to convey the same impression to the touch that they did during life. The knowledge thus gained has revolutionized our ideas about pelvic inflammations. Until quite recently the teaching on this subject was vague and unsatisfactory. Whenever a hard mass was detected above the vaginal roof on one or both sides of the cervix uteri, the case was pronounced to be one of pelvic cellulitis, with exudation at the base of the broad ligaments. It is quite true that many years ago that excellent French observer, Bernutz, combated this view, and produced evidence to show that those hard, irregular masses above the lateral fornices were generally due, not to cellulitis, but to peritonitis. But his words fell on deaf ears, for old beliefs die hard, and men were not prepared to throw over as an exploded error what had appeared to them almost the one pathognomonic sign of an otherwise obscure disease.

“ In the year 1886 Dr. W. M. Polk, of New York, published a remarkable paper in the first volume of the transactions of the Association of American Physicians, entitled ‘ A Study of Periuterine Inflammation in its Relation to Salpingitis, Based upon Sixteen Cases of Extirpation of the Tubes and Ovaries Occurring in Bellevue Hospital.’ After giving a brief sketch of the history of medical opinion on the subject of pelvic inflammations, and examining the questions from the standpoint of analogy, he proceeds to enquire what evidence is furnished by the facts of the necropsy and operating rooms, which are, after all, as he says, ‘ the pivots of our faith in medical science.’ With reference to the post-mortem evidence, he states that, at Bellevue Hospital, it is rare, except in the case of patients who have died from septicæmia, to find any proofs of pelvic cellulitis, unless it be clearly secondary to a previous inflammation of the pelvic peritoneum. ‘ On the other hand, nothing is more common than to find evidences of peritonitis about the ends of the tubes, and it is noticeable that in such cases the evidences of such inflammation diminish as you leave the extremities of the tubes.’ And he sums up this part of the subject by saying that the post-mortem evidences go to

show that periuterine inflammation 'is a product of salpingitis and not secondary to cellulitis, and that, if cellulitis is present, it is either secondary to peritonitis, or else is a lesion of septicæmia, in common with those which belong to that order when originating in other parts of the body.' He then proceeds to give the records of sixteen patients who presented the signs commonly attributed to pelvic cellulitis, 'but in whom abdominal section showed salpingitis, periovaritis and peritonitis. In two of the cases there was slight œdematous swelling of the cellular tissue in the broad ligament, just beneath the spot in which an inflamed tube had rested; in the remainder the most careful examination failed to detect the slightest induration or swelling in any part of the cellular tissue that lay about the uterus or between the peritoneal layers of the ligaments.' Bi-manual vaginal exploration of the uterus and its surroundings was employed in each case both before and after the operation. 'Before the operation indurated sensitive masses were present about the uterus in each patient, and the mobility of the organ was impaired to a greater or less degree. After the operation the masses could not be found in a single case, and the mobility of the uterus was restored to about its normal range in nearly every instance. During the operation two fingers were placed astride the broad ligaments, every portion being thus readily explored. The entire pelvic floor was likewise examined by touch, and whenever the method seemed incomplete, the opposing fingers of an assistant were placed in the vagina. Between the two it was impossible for any induration or thickening to escape detection.' I have quoted freely from this paper because its conclusions rest on a solid foundation of facts. If time permits, I propose to present you with corroborative evidence from my own ward at St. Thomas's. In the meantime, I may say that my experience in abdominal surgery enables me to confirm to the fullest extent the propositions that Dr. Polk lays down.

"One word as to the sequence of pathological events in these cases of salpingitis and pelvic peritonitis. Where does the inflammation commence and what is its etiology? In the great majority of cases the inflammation begins in the mucous membrane of the uterus, either from septic absorption, or the

poison of gonorrhœa, or the infection of tubercle, or simple catarrh, or from getting the feet wet during menstruation. It spreads from thence along the mucous lining of the fallopian tubes, just as inflammations of the mucous membrane of the respiratory tract of the urinary organs spread along their various portions. There being no ready means of exit from their secretions in the case of the fallopian tubes, the discharges, whether of mucous or pus, accumulate, and by so doing aggravate the inflammatory process. The inflammation thus tends to spread still further outward beyond the fimbriated extremity of the tube to the adjacent peritoneum, and a localized peritonitis is thus established, with its focus at the mouth of the tube. The result of this sometimes is promptly to seal the end of the tube, which then becomes distended by the secretions, and forms a more or less distinct tumor. In other cases the peritonitis appears to commence by the sudden pouring out of the morbid secretions from the fimbriated extremity into the pelvic cavity, setting up sudden and violent pain, followed by all the signs and symptoms of an attack of acute pelvic inflammation. Up to this point the process has been probably painless. Endometritis and endosalpingitis are not characterized by pain, but the moment the peritoneum is reached pain begins; so that what may seem to be the starting point of an illness, often is, in reality, merely an indication that the inflammatory process has passed from a mucous to a serous membrane. The inflammation of the uterine mucous membrane may by this time, especially if it is simply catarrhal, have subsided. The canal of the cervix usually allows free escape of the inflammatory secretions, so that an inflammation of the mucous lining of the uterus is ordinarily a much less serious affection than a similar inflammation in the fallopian tube, where the readiest outlet is into the peritoneal cavity.

“With regard to pelvic cellulitis, there is strong reason to believe that this disease, when it is the primary affection, is always septic, and that it is carried by the lymphatics through the uterine or cervical tissues themselves to the connective tissues immediately adjacent. The old idea, that some patients are so susceptible that the mere passing of a uterine sound will set up a cellulitis, puts the blame on the wrong shoulders. Neither a clean sound nor a clean wound ever yet produced a cellulitis.

“It will facilitate our study of the distinguishing characters of these two inflammations if we consider for a moment the anatomical distribution of the two tissues involved. The peritoneum in the female pelvis is reflected in front from the anterior abdominal wall on to the fundus of the bladder a little above the top of the symphysis pubis. It thence passes down the posterior surface of the bladder as far as the level of the os uteri internum, when it is reflected upward and forward on to the anterior surface of the uterus. This reflection forms the vesico-uterine pouch. After investing the fundus uteri the peritoneum passes downward and backward over the posterior surface of the body of the uterus, the posterior surface of the supra-vaginal portion of the neck of the uterus, and behind the upper fourth of the posterior vaginal wall. Here it is reflected on to the front of the rectum and the posterior pelvic wall, forming a pouch or sac, which is the most dependent part of the peritoneal cavity. This pouch is bounded laterally by two folds of peritoneum, called the utero-sacral ligaments or Douglas’s folds, which pass one on each side from the lateral borders of the supra-vaginal portion of the cervix uteri, upward and backward to the sacrum, the upper margin of the folds reaching the sacrum at about the level of the second sacral vertebra. Returning to the uterus, the peritoneum, after investing the body of that organ, is prolonged outward from its lateral borders in the form of a fold to the lateral wall of the pelvis on each side, forming with the uterus a sort of curtain stretching across the whole breadth of the pelvis. This fold is the broad ligament. It encloses along its upper border the fallopian tube, which runs outward to within a short distance of the side of the pelvis, and then leaves the broad ligament to terminate behind it, the last portion of its course describing a curve backward, downward and inward, so that the fimbriæ embrace the outer surface of the ovary, which latter organ lies behind the broad ligament on a lower plane than the main portion of the tube. Immediately below the ovary the layers of the broad ligament separate, becoming reflected on to the anterior and posterior pelvic walls respectively. It must be remembered that, although we speak of the surface as anterior and posterior, in the erect posture and in the normal condition the so-called posterior surface is in

reality directed upward and backward and the anterior downward and forward.

“The cavity of the pelvis being divided transversely by a curtain consisting of the uterus and the broad ligaments, the spaces behind the broad ligaments may be spoken of as the right and left posterior quarters of the pelvis, while those in front may be called the right and left anterior quarters of the pelvis. These latter are so shallow, and, except under very exceptional circumstances, so destitute of important contents, that they are of little or no practical importance. On the other hand, the two posterior quarters of the pelvis, with Douglas's pouch between them, possess the highest clinical interest. The latter because fluids in the peritoneal cavity tend to gravitate into it, and because, dipping down as it does behind the upper part of the vagina, it can easily be reached on vaginal examination; the former, because they contain the free ends of the fallopian tubes and the ovaries—structures, many of the morbid alterations of which can be ascertained by the bi-manual method with considerable accuracy.

“Turning now to the distribution of the pelvic connective tissue, we find that, except perhaps over the fundus uteri, a layer underlies the entire pelvic peritoneum, parietal and visceral. The so-called ligaments of the uterus contain a greater or less quantity between the peritoneal folds of which they are composed, while in certain special situations the connective tissue may be said to be abundant, for example, around the supra-vaginal portion of the cervix, along the base of the broad ligament, and behind the symphysis pubis.

“In the case of cellulitis originating in the cervix, the cellular tissue immediately surrounding the cervix is the first to be affected. The inflammation then spreads along the base of the broad ligament to the lateral wall of the pelvis. It may also affect the vesico-uterine cellular tissues in front, or the utero-sacral ligaments behind, in which latter cases the rectum will be surrounded with exudation on at least three of its sides, and in some instances will be completely encircled.

“We are now in a position to discuss the different diagnoses of pelvic inflammation.

“1. *Etiology*.—Pelvic peritonitis, in the great majority of cases, is secondary to disease of the lining membrane of the uterus, and, for the most part, travels to the peritoneum along

the fallopian tubes. This mode of origin is found in all the cases due to gonorrhœa, and in all the cases due to catarrh. It is also found in most of the cases resulting from tuberculosis, and from septic infection. In a certain number of cases of septic peritonitis the inflammation spreads directly to the peritoneum through the parenchyma of the uterus, by means of the lymphatics or the veins of the connective tissue, but where this is the case there will be cellulitis as well, for the inflammatory process affects all the tissue *en route*. Pelvic cellulitis, on the other hand, when a primary disease, is always septic and spreads directly outward from the body or cervix uteri through the parenchyma. There is, therefore, no involvement of the fallopian tube.

“These considerations have considerable bearing on the diagnosis. Thus, if a case of pelvic inflammation be known to have a gonorrhœal or a catarrhal origin, the tissue affected will be the peritoneum; if it occur after abortion, or labor, or an operation, or the passing of a tent or a sound—that is, if it be known to be septic—it may be either a peritonitis or a cellulitis, or both. If it be tubercular, it will be peritonic and not cellulitic.

“Of course, pelvic peritonitis may arise from other than the causes just mentioned—as from the presence of tumors, the ruptures of cysts, hæmorrhage into the peritoneal cavity, disease of the vermiform appendix, intestinal perforation, etc., but in none of these cases will there be associated disease of the fallopian tube, except as a coincidence, or any of this hard, irregular swelling in the lateral fornix, which is the main element of difficulty in discriminating between the pelvic peritonitis and the pelvic cellulitis.

“2. *As to the Amount of Pain.*—It is generally held, and with truth, that the presence of acute pain points to the pelvic inflammation being peritoneal. Cellulitis, when uncomplicated, is a disease not attended with pain; at any rate, not with severe pain. But we must remember that salpingitis is also a painless affection, and that the sudden onset of severe pain in an attack of pelvic inflammation is not to be taken as marking the commencement of the inflammation, but as indicating that it has reached the peritoneum.

“After the acute stage of peritonitis has passed, the pain is only felt after standing and walking. The tenderness, how-

ever, remains, and is apparent on vaginal examination and on coitus. Pain, however, is a most misleading symptom, for it is never so marked in cases of actual disease as it is in some neurotic patients who have no pelvic lesion of any kind.

"3. *The Physical Signs.*—In the early days of an attack of acute pelvic inflammation, physical examination tells us little or nothing. The vagina is hot and tender and its vessels may be felt pulsating, and that is all. But in chronic inflammation and in acute inflammation, when exudation has occurred, the physical signs are usually highly characteristic.

"In cellulitis arising from the cervix, we find either a uniform hardness and resistance in one or both lateral fornices, with depression of the vaginal roof and partial or complete obliteration of the cervix, or a collar of induration immediately in front, or immediately behind the supra-vaginal portion of the cervix. In pelvic peritonitis, on the other hand, there is no depression of the lateral or anterior fornices, for the exudation is within the peritoneal cavity, and, if it encroaches upon the vagina at all, it does so posteriorly and there only. It will then be felt as a distinct swelling in Douglas's pouch, obliterating the posterior fornix and pushing the uterus forward, if it is extensive, and forming an elastic tongue-shaped swelling behind the cervix and upper part of the posterior vaginal wall, if the amount of exudation is small.

"A similar condition exists in the conditions found on rectal examination. In cellulitis affecting the tissues behind the cervix, including the utero-sacral ligaments, the rectum in that region will be felt to be surrounded wholly or partially with a hard belt of exudation. Whereas, an exudation due to pelvic peritonitis will be confined to Douglas's pouch, and will be felt to be entirely in front of the bowel, though it may, and generally does, bulge into it. The swelling, moreover, will be less hard.

"When the body of the uterus is the starting point of a cellulitis and the broad ligament is the seat of the exudation, bi-manual examination will reveal a hard, smooth, flattened tumor by the side of the uterus, sometimes displacing it slightly to the opposite side. This tumor can be moved within certain narrow limits, backward and forward, between the two hands.

"Later on, when the exudation has reached the sub-perito-

neal connective tissue of the abdominal wall, it will give rise to a smooth, hard swelling beneath the abdominal muscles, occupying either the region immediately above Poupart's ligament, which forms its lower boundary, or the subra-pubic region. No such swelling or sense of superficial resistance is found in peritonitis.

"What, then, are the characteristic signs of pelvic peritonitis? There is a hard, tender, irregular swelling, felt on bimanual examination, lying posteriorly in the pelvis, above the vaginal roof, and not implicating or depressing it. This mass consists of thickened peritoneum surrounding the thickened fallopian tube and the ovary, the two latter being matted together by adhesions to each other, to the back of the broad ligament, and to other parts in the neighborhood. The uterus is seldom pushed aside by this mass and does not form, as it were, a part of it, as in cellulitis of the broad ligament. If the uterus is displaced at all, it is displaced forward, unless it has been retroverted or retroflexed to begin with, when it will have become adherent in its abnormal position. Very often the mass can be felt to extend behind the uterus, and to be adherent to its posterior surface. It is very seldom that any evidence of the presence of a pelvic mass of the kind just described can be obtained on examination of the abdomen. This is only possible when there is superadded an encysted peritoneal effusion, or when some of the pelvic viscera have happened to contract adhesions to the abdominal wall."

*Shortening of the Round Ligaments for Uterine Displacements.*

—DR. HENRY P. NEWMAN read a paper upon the remote results of uterine displacements by the new direct method before the Gynæcological Society of Chicago in November, 1890, in which he says he presented to the same society this new method of operation at a meeting in September, 1888, and reported several consecutive cases. In the original technique of Alexander, the primary incision is made over the spine of the pubis, an inch and a half or more in length, upward and outward along the course of the inguinal canal. In operating after his plan, it is often impossible to find the ligament, and the new method is intended to overcome this difficulty, the distinct advantages of which are: (1) The single sweep or two with which we cut down upon the inguinal canal, or the gliding aponeurosis of the transversalis muscle, directly

over the internal ring or canal of Nuck. (2) Through a single nick in the course of the separated fibres of this aponeurosis the blunt hook may often be passed into the canal, and the round ligament pulled out in less time than it takes to tell it; or, by lengthening the incision, it may be exposed along the canal in its entirety. (3) There can be no doubt here of the identity of the ligament, as a duplication of the peritoneum is seen surrounding it at its abdominal extremity. (4) The force used in pulling out the ligament is both brought to bear upon it at its strongest portion, and is in a direct line with the intra-abdominal course. This is in strong contrast to the old mode of pulling upon its frayed-out terminal fibres at an acute angle with its inner and stronger portion and over the sharp resisting surface of the ring. (5) Aided by the sense of sight, and seizing the ligament above the inguinal canal, we can feel assured that we are drawing upon the abdominal portion of the ligament, and not merely stretching its inguinal section. (6) As there are few or no adhesions at this portion, there should be absolutely no tearing of the tissues. Consequently, where aseptic methods are used, there should always be healing by first intention, and drainage and after-treatment be relatively simplified. (7) Where the ligament is strong and fully developed, as it is in its upper portion, it can be more securely anchored or made fast to the surrounding tissues. (8) Hernia is guarded against by deep sutures constricting the canal above the internal ring, insuring firm union where most needed. (9) The intercolumnar fibres and tissues about the external ring are not interfered with or irritated in any way.

Inasmuch as many of the abdominal muscles have fibres converging about the pillars of the external inguinal ring, movements of the body often create disagreeable tension and cause pain in a wound situated here, and I have observed these distressing symptoms to continue for weeks afterward. I attribute their absence, in my later cases, to the fact of avoiding these sensitive areas and minimizing mutilation by the higher incision.

*The Reciprocal Effects of Pregnancy and Parturition upon the Operation of Shortening the Round Ligaments.*—Dr. WILLIAM ALEXANDER, of Liverpool (*Brit. Med. Jour.*, February 14, 1891), in a paper upon this subject, seems to feel that this

operation for suitable conditions is becoming more and more recognized as a valuable resource of surgery. He gives his experience with the effects of the operation upon subsequent pregnancy and parturition. "It has been erroneously supposed," he says, "that shortening the round ligaments will prevent the usual course of pregnancy, causing it to terminate in abortion, or, should pregnancy come to term, and parturition take place, the round ligaments will be so stretched that the old displacement will recur." These erroneous ideas he thinks natural, especially when we consider the extremely hazy conclusions given in our text-books as to the mechanism by which the uterus is maintained in its position, both in healthy women, who have no displacements, and also in patients whose round ligaments have been shortened. The round ligaments after the operation are usually passive. His experience is that the occurrence of pregnancy is favored, in cases of retroflexion and retroversion, by the operation, and that when pregnancy occurs, it proceeds and terminates naturally. Also that in backward displacements, the displacement does not tend to recur after parturition, while in cases where the round ligaments have been shortened for prolapse of the organ, the return of this displacement will largely depend upon the amount of destruction of the peritoneum. He disputes the assertion that the ligaments are stretched to any great extent by pregnancy, or left in an over-stretched condition by it, as without being stretched at all these ligaments will allow the uterus to rise to a considerable extent into the abdominal cavity, provided all the other attachments of the uterus are cut through. It would appear to be impossible for the organ to rise to the usual height in the abdomen without stretching these ligaments. but he has proved satisfactorily to himself, by post-mortem examinations, that they are not stretched, but that the uterus grows away from it; in other words that at the full term of pregnancy the fundus is very much above the attachment of the ligaments as compared with its position before pregnancy occurred. In substantiation of this opinion, he quotes the words of Dr. Jaggard in the *American System of Gynecology*: "On account of the relatively greater development of the posterior uterine wall, the origin of these ligaments is apparently moved forward to a point at the junction of the anterior fifth with the posterior

four-fifths of the antero-posterior diameter of the uterus in the latter stage of pregnancy." Dr. Jaggard, in the same article, also refers to the facility with which the uterine cavity will increase at the expense of whatever part of the uterine wall offers the least resistance. Dr. Alexander believes that the broad ligaments, round ligaments, adhesions, etc., are always partially left behind by the expanding uterus and can be left still further behind should necessity arise, through special shortness of the ligaments, strong adhesions, etc. Post-partum involution of the uterus tends to restore the position of parts to that which existed before pregnancy.

He therefore holds that in pregnancy the shortened round ligaments are not much strained because, "(1) The distance from the internal ring to the site of their attachment to the uterus is probably not greater in the pregnant than in the unimpregnated uterus; (2) that any strain during pregnancy upon the shortened ligaments does not so much produce stretching of these ligaments as development of the uterine cavity in a direction that does not increase the strain, and consequently the attachment of the ligaments apparently to a part of the body of the uterus much nearer the cervix than usually occurs; (3) that any stretching of the ligaments which may occur is probably rectified by post-partum shortening, and that both uterus and ligaments reassume, if involution has been natural and complete, as nearly as possible the condition that existed before pregnancy took place."

"These are the theoretical exceptions of the undoubted fact that pregnancy and parturition are not necessarily, or hardly ever interfered with by the operation." To substantiate these claims he quotes several appropriate cases.

*The Peritoneum in Abdominal Section.*—Dr. KELTSERBORN, of Dorpat, has reported a series of experiments (*Centrallblatt f. Gynäkologie*), which will prove of value to all who are interested in abdominal surgery. His conclusions are different from those of Von Dembowsky and Sänger. The latter maintains that a single raw surface, formed by stripping off the peritoneum, is sufficient for the development of an adhesion, while two such surfaces in opposition must surely unite. Sänger further holds that no endothelium is formed anew to cover the peritoneal defect, so that an adhesion is unavoidable.

Von Dembowsky finds that ligatures, stumps and cauterized

surfaces usually cause peritoneal adhesions, while endothelium, coagula, irritating and antiseptic fluids, and slight bruises and incisions of the peritoneum do not cause adhesions when that serous membrane is healthy.

Dr. Kelterborn made eighteen abdominal sections upon cats. In all but two cases, the subjects were prepared for the operation just as in cases of ovariectomy, even to every detail, diet included, the operation being performed always under chloroform. Diet was restricted for several days after the abdominal sections, as it was found in some of the earlier cases that free feeding had a very prejudicial effect upon the abdominal wound. The abdominal sutures were introduced after the plan of Sir Spencer Wells, each suture being threaded to two needles and each needle being introduced from within outward through the peritoneum muscle and the whole thickness of the abdominal wall close to the edge of the wound. He paid particular attention to the effects of the cautery. Contrary to the experiences of other writers, he found that cauterized surfaces of healthy peritoneum, even when of some extent, tended to heal completely, the cauterized spot ultimately being covered over with a new layer of endothelium. This was the case whether the cautery was of the parietal peritoneum or the serous investments of the intestines, stomach and other abdominal organs. No adhesions formed and the surface was smooth and shiny; but when more than the serous coat was burned, especially when the vessels of the intestines were damaged by the cautery, bad results, such as suppuration, often occurred. Pieces of the scrota of the bowels, about one-third by one-sixth of an inch, and of parietal peritoneum, about one inch broad by one-sixth, was scraped off by a sharp curette or dissected away. The results were uniform, no adhesions being found three weeks after, when the subjects were killed.

The author notes that in healthy women plenty of ripe follicles burst on the surface of the ovary, leaving large scars, yet no adhesions are formed with the intestines or tube, and he thinks that in adhesive perimetritis the surface of the ovary is first infected from the tube, and then, and not otherwise, rupture of a follicle becomes a source of adhesions. He found, also, that ligatured pedicles and pieces of parietal peritoneum, transfixed by a needle and ligatured, do not tend to adhere to

anything in healthy subjects. But it is an interesting fact that adhesions of the omentum to the median line often occurred in the simplest cases, even where there was no reaction after operation, and adhesions were limited to the site of suture, and were as frequent when disinfected silk was used, as when simple cleaned silk was employed. He attributes these adhesions, or rather this, to have been promoted greatly by the effect of air left behind within the peritoneal cavity after operation. The air pushes the omentum against the abdominal wall. The air left confined in the peritoneum escapes through the wound between the sutures. Ligatures left in the peritoneal cavity, he says, do not set up adhesions, but tend to become encapsulated. Adhesions occurring after abdominal section, where the peritoneum is previously healthy, can be traced to infection.

*Uterine Curette and Anæsthetics.*—Dr. GEIEL (*Nouvelles Archives d'Obstet. et de Gynæcol.*, December 25, 1890). does not consider that chloroform is necessary, or even advisable, for the operation of scraping the endometrium in cases of endometritis. He maintains that the proceeding is absolutely safe, providing that the manipulations are skillful, and adequate precautions against sepsis be taken. Cicatrices and atresia of the cervix need never occur, and hæmorrhage should cease directly the operation is performed. Dr. Geiel dilates the cervix with a tapelo tent. Within thirty-six hours the patient will be ready for the curette. The use of that instrument causes but little pain, and the little which it does cause is necessary for the detection of the most diseased spots on the endometrium. The patient is placed in the correct position and the tender spots are marked out by the touch of the sound. Then a twenty per cent. solution of hydrochlorate of cocaine is applied to the most tender parts, while the remainder of the uterine cavity is painted with a ten per cent. solution of the same compound. The anterior lip of the os is then seized by means of a volsella, and held by an assistant, so as to keep the uterus fixed and well drawn down during the operation. The endometrium is dried with wool and then carefully scraped, especially at the tender points. The characteristic grating sound (*cri utérin*) should be heard over every part subjected to the curette, as it indicates that the diseased material has been thoroughly scraped away. Lastly, the uterus

is washed out with a 0.05 per cent. sublimate solution. This washing is better than swabbing (*ecouvillonnage*). The after-treatment consists in the administration of antiseptic vaginal injections, and in the introduction of iodoform-glycerine tampons. With the above precautions the curette may be safely used in cases of pure endometritis.

*The Treatment of Interacting Bladder and Kidney Disease in Women.*—This clinical lecture is based upon two cases of women with simultaneous pain in the bladder and kidneys. One patient passed urine full of pus, the kidneys were large and painful, and she suffered from agonizing attacks of vesical spasm. There was also feverishness, with dry tongue and dyspepsia. On mature deliberation, M. Guyon concluded that the origin of the trouble lay in the bladder, and that it was not advisable to operate on the kidney at once. The bladder was therefore laid open from the vagina, and kept open. The vesical pains at once ceased, the spasms never returned. More slowly the condition of the kidneys improved, the pain disappeared, and then they diminished in size until they ceased to palpate on manual exploration. M. Guyon bases treatment of this kind on a careful examination of the bladder. When, as in this case, the sound causes severe pain when it touches the mucous membrane, when the bladder is tender on pressure of the hand over the pubes, or of the forefinger against the anterior vaginal wall, the primary lesion will be in the bladder, and the renal swelling and pain will be secondary. Let the bladder rest then the kidney will empty itself and this will cause subsidence of the pathological changes in the renal pelvis and glandular tissue. All such cases do not demand so active a treatment as cystotomy. Simple medical treatment of cystitis, rest and weak antiseptic injections may be sufficient if taken in time. On the other hand, Bozeman's treatment of pyonephrosis by establishment of a vesico-vaginal fistula and subsequent catheterization of the ureters cures the renal complication on the same principle; but the practice is only to be undertaken by experts. The gynecologist and surgeon must not be misled by theories about reno-vesical reflexes, which imply that the primary disease lies in the kidney. M. Guyon's second patient was in an earlier stage of treatment when the lecture was delivered, but the vesical pain, fever and dry tongue had disappeared. In a

neighboring ward lay a man who had entered with retention and infiltration of urine from giving way of the urethra; at the same time a large pyonephrosis of the right kidney was detected. The infiltration and retention was treated in the usual manner. Within two months all the physical signs of pyonephrosis had completely disappeared. "To run to the assistance of the kidneys by methodical treatment of the lower part of the urinary tract should be a fundamental law of surgery."—*Prof. Guyon in Annales de Gynec.*

Drs. SPAETH and HOFMOKL (*Lon. Med. Rec.*) calls attention to the danger of allowing coitus to take place too soon after a lacerated perineum has been repaired, and reports two unique cases. The patients were discharged from the hospital within a month after perineorrhaphy had been performed. In both instances intercourse occurred within two or three days after their return home, and transverse tears were caused in the posterior vaginal fornix, from which profuse hæmorrhage resulted which necessitated the application of sutures. It was remarkable that the injury occurred, not in the fresh cicatrix, but in the vaginal vault, which might be explained by the fact that the posterior wall of the vagina was shortened and thus put on the stretch in consequence of the operation. Another woman perfectly healthy, married at the age of thirty-one, and from the first had pain during coitus. A few days after marriage she had violent pain during the act, which was followed by profuse hæmorrhage. Four days later focal matter escaped per vaginam while she was at stool. On examination the external genitalia were found to be normal. The columns of the posterior vaginal wall were torn away from their attachment, and there was a recto-vaginal fistula admitting the little finger. Hoimokl reports four cases from Vienna and Prague. In one case a powerful young man had intercourse with a widow, aged fifty-eight, causing a tear in the vaginal fornix with profuse hæmorrhage. In the second, violent coitus in a sitting posture produced a rupture of the posterior fornix involving the peritoneum; the patient lost much blood, but recovered. The third case was that of a girl, aged seventeen, whose lover had violent intercourse with her while she was in an exaggerated lithotomy position, causing a large tear in the right wall of the vagina. The fourth case was that of a young girl who had an undeveloped vagina with absence of

the uterus and adnexa. During a forcible and unsuccessful attempt at coitus she sustained a deep laceration of the left labium majus, which was torn away from the vaginal wall. The tear extended upward into the mons veneris and downward toward the rectum, while the finger could be introduced into the vaginal wound to the depth of two inches. Profuse parenchymatous bleeding was checked by pressure, and the patient was discharged at the end of four weeks cured, but still anæmic from the loss of blood. In Spaeth's case of recto-vaginal fistula (the sixth on record), the injury did not occur during the first coitus, but after several successful attempts had been made; it appeared to be due not to any disproportion between the introitus and the male organ, but to an abnormal thinness of the recto-vaginal septum associated with a broad, resistant perineum. He classifies the different injuries as follows: Deep tears of the hymen, with profuse hæmorrhage, tears of the clitoris, of the urethra (in cases of atresia hymenis), vesico-vaginal fistula, laceration of the vaginal fornix (usually the posterior or lateral), and of the septum in a duplex vagina, to which should be added injuries of the vagina from premature coitus after perineorrhaphy.

Dr. ROBERT BARNES contributed a paper before the British Gynæcological Society with the title, *The Correlations of the Sexual Functions and Mental Disorders in Women*, which constitutes an exceedingly valuable and clear exposition of many important facts and theories in the joint domain of psychical and gynæcological medicine. Every practitioner is more or less familiar with the frequent association of aggravated disturbance of the nervous system and mental sphere with uterine or ovarian disease. The important consideration in such cases is to determine the mutual reactions of these two disorders—which occurred first; which is cause, which effect? The influence of heredity is to be borne in mind, but it is a gross mistake to consider it an essential factor. With sexual disorder as a cause of mental or nervous disturbance, determined or probable, is an appeal for relief made to gynæcology as often as it should be or in the language of Dr. Barnes himself: "Has this enlightening and beneficent surgery (gynæcological) been fairly applied to the study of physiology and pathology of women or to the relief of women secluded in lunatic asylums?" Reference is made to numerous clinical

instances illustrating the relationship of the menstrual function and its perversions to nervous and mental phenomena of a morbid nature. The beginning of menstruation is the signal for mental disturbance with grave frequency, especially when heredity predisposes. The appearance of the first menstruation after labor has been often the signal of an attack of insanity, first called to the attention of the writer by Bailarger, at the Paris Salpêtrière, and since verified by him in several instances. The epoch of severest trial is, however, the climacteric or menopause.

Tilt emphasizes the danger of marriage at the climacteric, and cites the history of an intelligent woman who married at fifty, had sudden uterine pains, followed by flooding, on the wedding night, and who became melancholic and bent on suicide. When menstruation ceased she got well. Savage has called attention to the development of insanity upon betrothal earlier in life. So far the author has referred only to mental disturbances associated with normal uterine function, or at least with no evidence, except in the disturbed nervous sphere, of organic trouble in the sexual apparatus. Dysmenorrhœa, menorrhagia and amenorrhœa, with or without anæmia and chlorosis, have been frequently observed in association with, and as the cause of various insanities and nervous affections, as chorea, epilepsy, hallucinations and amnesic states. Hysteria, that complex and poorly understood neurosis, is so often found associated with these perversions of menstrual function as to have been noted by every observer. Barnes wisely says that hysteria is frequently the forerunner of insanity. Though not directly related to the subject of his paper the author calls attention incidentally to the association of insanity with obstinate constipation, especially to that form characterized by accumulations in the cæcum and transverse colon, the bowels acting perhaps daily, but never emptying. In such cases you get in addition to the effects of mechanical pressure and irritation of the pelvic organs, certain forms of toxæmia due to the absorption of fecal matter. To this kind of empoisonment the author has given the name "copræmia." He relates an example, in his own practice, of insanity associated with this condition, and quotes from a note from Dr. Alexander Newington, an alienist, reporting four cases of acute mania "*cured*" by clearing out the transverse colon of

large fecal accumulations by means of the long tube with oil. "If we pass next to the neuroses that attend morbid or diseased conditions of the uterus and ovaries," says Barnes, "we get even more striking evidence of causation." Among such conditions his experience proves displacements to be quite frequent and retroflexion or version, with prolapsus, the most common of all; pressure upon the sacral plexus and irritation of the highly organized (female) lower cord is the explanation. He has himself cured a number of cases of insanity, due to such causes, by surgical or other treatment, relieving the uterine disease, and he quotes similar cases from Brownington, C. E. Louis, Mayer, Schroeder, von der Kolk, Fleming, Maudsley, Arbuckle, of the West Riding Asylum, and Groisinger.

Ovarian disease is of equal, or even greater importance as an agent, producing mental alienation, but with regard to this phase of the subject a new factor presents itself for consideration in the by no means infrequent development of insanity as a *result* of operation for removal of the ovaries. Sir Spencer Wells has had such experiences. Dr. Savage, of Birmingham, had, out of 483 double ovariectomies (26 deaths), 4 cases of insanity. Thomas Keith has not observed any mental failure following removal of the ovaries alone, but out of 64 hysterectomies with removal of both ovaries, six (6) became incurably insane. Lawson Tait, on the other hand, with an equal if not greater experience, has never observed any case of insanity among his patients [non-observance does not necessarily involve non-existence]. The author suggests that the subject should receive most careful and extended investigation. Such experiences are not, after all, an argument against operation or other procedure for the cure of ovarian disease, which precedes and probably causes the mental disturbance. As to the question, "Are we justified in operating upon a lunatic who cannot give a responsible assent, clear indications existing for the operation?" the author quotes the advice of the English Home Secretary, Sir Wm. Harcourt: "If she is incapable of judging for herself, treat her as a child." Barnes does not believe in the advisability of removing the ovaries for epilepsy, the experience of Lawson Tait having been decidedly unsatisfactory. Incidental reference

is made to a peculiar type of insanity, dependent upon disease of the generative organs in women, which is of great medico-legal importance. It is characterized by hallucinations, sometimes amounting to delusions of violation, and may be the only evidence of mental disorder. False charges of rape and seduction may originate in such delusions.

The insanities of pregnancy and the puerperal period are considered under a separate division, apparently with the object of emphasizing the importance of this phase of the subject. The author insists upon a close analogy between parturition and menstruation, which he considers a "mimic pregnancy" (labor?), extending the analogy to include the associated or dependent disturbances of the nervous or mental system which belong to both conditions. As to the cause of the nervous disturbances of pregnancy, he believes them to be a result of high nervous and vascular tension; the nervous disorders (including mental derangements) of puerpery and lactation are the result of shock, lowered nervous and vascular tension, and spanæmia with toxæmia. The hypothesis is advanced that minor degrees of thrombosis may constitute a stage or factor in the production of these insanities. The paper concludes with an urgent appeal for the establishment in all institutions for insane women of a systematic and careful examination for possible causes of mental derangement in disease of the pelvic organs, which, when found, should be relieved, if necessary, by operation.

The subsequent discussion, participated in by such distinguished men as Hack, Tuke, Savage, Bantock, McNaughton Jones, Wilks, Percy-Smith, Edis and others, constitutes an exceedingly interesting array of opinions, which should be read in their entirety to be fully appreciated. Only a brief reference to the most salient points is permitted by the limits of this synopsis. Dr. Savage, while readily admitting a frequent and more than accidental relation between insanities and disease of the pelvic organs, stated that as a fact only a relatively small number of cases in insane asylums had been benefited by the results of examination in this direction. In connection with the subject he suggested, as worthy of investigation, the question as to the advisability of ovariectomy for insanities associated with or caused by masturbation. As to

the insanity of pregnancy he observed that it was but the exaggeration of the usual disturbances of an ordinary pregnancy, such as hallucinations or perversions of taste, smell, morbid desires, etc. He thought it wrong to induce labor in such cases, since he had seen such cases not improved by miscarriage. [Miscarriage and induced abortion are, however, not the same, and the effect upon the woman is probably radically different, as was suggested by Dr. Barnes in closing the discussion.]

Continuing, Dr. Savage remarked that sexual perversion as a form of insanity was quite often dependent upon or associated with malformation or disease of the generative organs, citing a case with an infantile uterus occurring under his own observation. Dr. Wilks alluded to several cases of morbid preoccupation on the subject of the genitals, which had culminated in insanity, and asked how far the mind, being directed in a particular channel, might be productive of mental symptoms. [Might not the mind be so directed by local disease?] Dr. Bantock spoke with special reference to the experiences of Keith, with which his own experience did not agree. He thought Keith's observations decidedly exceptional, and his own views coincided with those of Lawson Tait. He urged the necessity of nice discrimination, admitting the undoubted relationship of pelvic disease to insanity in certain cases. Dr. McNaughton Jones related the case of a patient with retroflexion and enlargement of both ovaries, who suffered for some time with melancholia and delusions regarding her parents; the uterus was replaced, the ovaries gradually reduced in size, and she made a perfect recovery at once. Another patient, with fibroid uterus, had a fixed delusion that during an examination her uterus had been pulled down and inverted.

*(To be continued.)*

## Hospital Reports.

### MONTREAL GENERAL HOSPITAL.

#### CONDENSED REPORTS OF CASES IN DR. MACDONNELL'S WARDS.

##### *Appendicitis—When to Operate.*

The history of W. W., aged 19, illustrates a very important point, viz., that all the symptoms of general peritonitis may be present from the first to the last and the disease may be local. Also, that very great apparent improvement may take place in the course of such a case, sufficient to throw the medical attendant completely off his guard, and lead him to the making of a favourable prognosis.

W. W. was admitted on Dec. 24th, 1890. He was a delicate lad, and it was more than probable that there was a tubercular family history, though both his parents were said to be alive. Five days previously to admission he experienced a severe chill, but it was not for two days that he actually felt severe abdominal pain. This was felt to be in the centre of the abdomen, and it was increased by motion and by straightening of the legs. On the fourth and the fifth days there was severe vomiting.

On admission he represented the typical appearance of a patient with acute general peritonitis. The decubitus was dorsal, and the legs were drawn up. Abdominal pain very severe. Tenderness great and evenly distributed over the abdominal surface, which is extremely tense and board-like. Tongue red and furred, brown in centre, and white at the edges. Temperature  $102.4^{\circ}$ ; pulse 120, fine and hard. The abdomen was poulticed, and fifteen minims of laudanum were given every three hours.

*Dec. 27th* (9th day).—A most deceptive lull in the violence of the symptoms was noticeable to-day. The vomiting, which had been troublesome since his admission, ceased, the temperature fell to  $99^{\circ}$ , and there was manifestly less abdominal tenderness. The question of operation was discussed, but this sudden spontaneous improvement decided us against it. On the next day it was too late. Pyæmia suddenly set in, showing

itself by sudden swelling of the right parotid gland and evidences of deep depression. He died next day (the 11th).

It was *ab initio* a case of appendicitis. The appendix was found doubled up beneath the cæcum. A large collection of pus surrounded the appendix, and extended as high up as the liver. There were some old peritoneal adhesions, but no recent general peritonitis.

*A history resembling that of Typhoid Fever—Gradual development of Peritonitis—Death—Autopsy—Cancerous Peritonitis.*

D. C., a delicate man, aged 28, a waiter, admitted Jan. 31st, 1891. Nine days before admission he began to complain of pains in the back, tenderness in the abdomen, and, on one or two occasions, vomiting. No epistaxis; no diarrhoea.

On admission, the temperature was  $100.8^{\circ}$ . Tongue moist, slightly coated with a thin white fur. It was not suggestive of typhoid fever. Pulse 110; heart sounds weak. Spleen not enlarged. The abdomen was full, prominent, and equal on both sides, tender on firm pressure, especially so in right iliac fossa. There is no dulness on percussion. No spots.

*11th day.*—Sharp pain in right iliac region. Temperature suddenly rose to  $104.5^{\circ}$ . No chill. At this stage of the disease it was thought that an obscure appendicitis was the cause of the symptoms.

*20th day.*—The symptoms have nearly all subsided. He has had a slight pharyngitis, but it has now quite disappeared.

*32nd day.*—Up to to-day the patient appeared as if he were convalescing, but to-day the temperature began to rise, and the abdominal pain returned with great severity. The tongue became coated, and there was some diarrhoea, the spots being thought to be of a typhoid character.

In the next two days the pain was very severe, but it was not localized. Vomiting became almost incessant. These symptoms subsided, to return about the 38th day, when the pain was noticed to be distinctly localized in the right iliac fossa. The vomiting returned and there was also severe hiccough.

*Result of Autopsy*—(Dr. Wyatt Johnston.)—Abdomen was tense ; subcutaneous fat scanty and of deep yellow colour ; surface of liver somewhat soft and covered with a grayish-white exudation ; coils of small intestine are somewhat reddened, and show a thin whitish, fibrinous smearing, though the peritoneal lustre is not lost ; small bowel greatly distended with fluid fæces. In the right iliac region the coils of intestine are adherent together. At about the middle of the ileum a loop is formed by an adhesion there, through which a knuckle of bowel is passed. No appearance of strangulation, though the bowel had to be torn in attempting to separate the adhesions, which were firmly organized. This matting was most marked in the right iliac fossa, and a firm mass lay just above the brim of the pelvis, formed by a tumor at the base of the mesentery. On removing the intestines a series of fæcal fistulæ were found between the intestines in the lower iliac region. The relation of the parts cannot be definitely made out, but the tumour surrounds a large fungating ulcerated surface involving the whole circumference of the ileum near the valve. On separating the adhesions it was found that the wall of the intestines and the parts immediately surrounding it are seen to be infiltrated with dense firm, gray tissue, apparently a new growth. The vermiform appendix in the region of the cæcum was surrounded by dense cicatricial tissue. Microscopical examination of the ulcerated mass in the ileum reveals carcinoma of the large cylindrical-celled variety.

## Reviews and Notices of Books.

**Cyclopædia of the Diseases of Children—Medical and Surgical.** By American, British and Canadian Authors. Edited by J. M. KEATING, M.D. Vol. IV; illustrated. Philadelphia : J. B. Lippincott & Co.

The high standard reached by the articles in the previous volumes is fully sustained in this, the last volume of the series. Dr. Burnett opens the volume with a most interesting article on Diseases of the Ear in Children. He tells us that children constitute 22½ per cent. of the cases attending his department at the Philadelphia Polyclinic, evidencing the importance of the subject to the practitioner. His excellent remarks on the hygiene of deaf children, in which he insists on the necessity of making use of and training even very imperfect powers of hearing in children, should be very generally read. They should not be allowed simply to drift into institutions for deaf and dumb, when want of use will surely destroy the little power they may have left. Three lengthy chapters are devoted to Diseases of the Eye. That on Ophthalmoscopy, by Dr. Oliver, is a most valuable one, and deals very fully with the appearances presented by local and symptomatic disorders of the choroid, retina, and optic nerve. Its illustrations are numerous and of a high class. Dr. Keating and Dr. Young conjointly constitute a long but very interesting article on Physical Development. It opens with a discussion on the ideal form of the human body, and the exact proportions it is desired that the several parts should bear to one another, and then proceeds to speak of the value various exercises have in strengthening and developing symmetrically the whole, and discusses the relation between mental and physical development. He quotes Sargent, who says that college men take about the same grade in their general studies as in their required athletics. In referring especially to the development of boys, Bowditch's and Roberts' tables are given indicating the relation between the weight and height of growing boys. From these it is evident that the period in a boy's life between the 16th and 17th year is one of great importance, during which no

great strain should be thrown upon his developing constitution, and that feats of strength or physical endurance should not be undertaken until this period is safely passed. The method employed by Dr. Sargent at the Hemenway Gymnasia at Harvard is given in full. Each student, upon his entrance, is thoroughly measured and examined, and an exact record kept. His deficiencies are noted, and a special order of appropriate exercises made out. The improvement he makes is noted from time to time. "One half the struggle for physical training has been won when he can be induced to take a genuine interest in his bodily condition, to want to remedy his defects, and to pride himself on the purity of his skin, the firmness of his muscles, and the uprightness of his figure." In his remarks on physical exercise for girls, he endorses Clarke's four conditions requisite for the proper education of the female—1st, a sufficient supply of appropriate nutriment; 2nd, a normal management of the catamenial functions, including the building of the reproductive apparatus. 3rd, mental and physical work so apportioned that repair shall exceed waste and a margin be left for general and sexual development; and 4th, sufficient sleep.

A very interesting article on School Hygiene is contributed by Dr. D. F. Lincoln. In speaking of the personal hygiene of the scholar, he deprecates the tendency among teachers to urge and arouse children who are doing well enough already, with the result too often that they have to be removed from school with damaged health. "Regular schooling should not be commenced till the end of the seventh year." "Every minute the child is kept at a lesson after its power of attention is exhausted is given to forming the habit of inattention which is clear loss to education." The various ailments, dyspepsia, chorea, neurasthenia, spinal deformities, etc., are discussed in their relation to school life. Under the division of internal hygiene, the site, ventilation, heating and draining of the school-room is discussed, along with the question of how to deal with the contagious diseases.

There are short articles on Massage, Prophylaxia of Disease in Children, Juvenile Crime, and Medico-legal Testimony.

Part IV, including somewhat more than half of the volume,

is devoted to diseases of the nervous system. It is opened by an interesting chapter on the Diagnosis of Diseases of the Nervous System by Dr. A. McLane Hamilton. Among the articles calling for special notice is one on Intracranial Tumors, by Dr. M. Allen Starr. A very interesting article on Toxic Affections from Arsenic and Lead, by Dr. J. J. Putnam. Dr. Charles B. Nancrede contributes a chapter on the operative Surgery of the Brain and Cord. Dr. Jas. Stewart writes clearly on the Primary Muscular Atrophies. Sachs contributes an excellent article on Chorea, and Dr. Mills an able article on Hysteria in Children.

Both editor and publishers are to be congratulated on the completion of this work. At present it stands pre-eminent in its department, and reflects credit on all the American profession. The paper, type, printing and illustrations are all of the highest order.

A. D. B.

**Surgical Bacteriology.** By N. SENN, M.D. Second edition. Philadelphia: Lea Bros. & Co. 1891.

That a second edition should be called for in less than two years is evidence both of the worth of the book and the interest taken in the subject. The special value of the book lies in the fact that it consists of a very full compilation of the important researches on a subject which is very imperfectly treated in text-books. In the second edition the work has been brought up to date without being materially increased in size, and a chapter on the alleged microbes of tumors has been added. It is to be regretted that no notice has been taken of recent work upon the action of disinfectant agents, which is a matter of much greater importance. A compilation of the different views with regard to the influence of bacteriology upon surgical technique would also have been a great addition, as the explanations given by various operators of their results are most contradictory. We are surprised to see that, in the chapter upon sources of infection, the bacteria present in the air are considered to constitute the chief danger. As each chapter, however, is complete in itself, these omissions do not lessen the value of the book to any one wishing to be well posted in the modern views with regard to surgical infectious diseases.

**Text-Book of Bacteriology.** By CARL FRAENKEL, M.D., Professor of Hygiene, University of Königsberg. Third edition. Translated by J. H. LINSLEY, M.D. New York: Wm. Wood & Co. 1891.

Those who are frequently asked to recommend a good, practical work on bacteriology will hail with relief the appearance of a translation of Prof. Fraenkel's well known work. It combines a description of the bacteriological methods with a very full, systematic account of the more important germs, and is for this reason to be preferred to any other work hitherto published upon the subject. One of its chief beauties lies in the fact that a large amount of complicated and confusing technical detail, now known to be unnecessary, has been left out. It is, without doubt, the one book necessary to anyone wishing to work at practical bacteriology. The only defect of the book lies in the fact that it has no illustrations, the original idea having been to supplement it by an atlas of micro-photographs. Fortunately, the absence of illustrations is made up for by unusually clear and vivid descriptions which have been remarkably well rendered in the translations. [W. G. J.]

**Syllabus of Post-mortem Methods.** For the use of Students in the Montreal General Hospital. By WYATT JOHNSTON, M.D., Pathologist to the Hospital. Montreal: G. Ashford. 1891.

This little book is a thoroughly practical guide in the technique of post-mortem examinations. The order and method of examination of the different organs are clearly given, and the dissection of the heart is illustrated by a couple of excellent diagrams. An account of the precautions to be observed in the performance of medico-legal autopsies is appended, and will prove a useful guide to those who are occasionally called upon to perform a post-mortem for this purpose. The weight of the normal organs and the method of drawing up a report are also dwelt upon. From personal observation we can heartily recommend the book as a reliable guide in the subject with which it deals.

## Society Proceedings.

### MEDICO-CHIRURGICAL SOCIETY OF MONTREAL.

*Stated Meeting, 15th May, 1891.*

F. J. SHEPHERD, M.D., PRESIDENT, IN THE CHAIR.

Dr. G. Laforest was elected a member of the Society.

*Combined Lateral and Posterior Sclerosis.*—DR. J. STEWART exhibited this case. The patient, a man aged 42, first showed symptoms of his trouble two years ago, in the form of weakness, stiffness, and difficulty in walking and standing, especially when the eyes were closed. When he came under observation two months ago, there was paresis of the lower limbs with marked ataxia and increased knee jerks. It was noticed, however, that in the course of the following month the knee-jerks gradually diminished, and were now completely absent. This was considered to be evidence pointing to the extension of the degenerative process from the postero-internal to the postero-external columns.

DR. JAMES STEWART read the notes of a similar case which had been under his observation at the Montreal General Hospital for a period of some weeks two years ago. The patient was 43 years of age, and presented the characteristic symptoms of combined lateral and postero-internal sclerosis. The patient died from erysipelas.

DR. FINLEY, who performed the post-mortem, was able to demonstrate the existence of degeneration of both the lateral (crossed pyramidal) and postero-internal fibres.

DR. RODDICK inquired as to the cause.

DR. ELDER asked, if a case be seen early, what symptoms would lead to a diagnosis between postero-lateral sclerosis and tabes?

DR. STEWART, to Dr. Roddick's question, replied that the patient had a history of syphilis, which he believed to be the cause. To Dr. Elder he answered that in tabes the knee-jerk was invariably lost, besides the presence of the Argyll-Robertson pupil, and lightning pains.

*Pericarditis.*—DR. FINLEY exhibited this specimen for Dr. Wilkins. The pericardial sac contained a large quantity of pus. The inner surface was covered with lymph and some fibrinous adhesions between the visceral and the parietal layer. The outer surface was also involved. The left lung was found glued to the pericardium. The endocardium was healthy. The chief point of interest was that the lesion was primary, there being no history of Bright's disease or rheumatism.

*Appendicitis.*—DR. ARMSTRONG read a paper on this subject from a case in practice, which appears in this issue of the JOURNAL.

*Discussion.*—DR. HINGSTON was doubtful as to the case being one of appendicitis. He had seen more than one case of appendicitis, when on the eve of an operation there would be a discharge of the pus. He thought that in such cases the pus emptied more frequently into the bowel.

DR. JOHNSTON had found pus in the retro-peritoneal region, the result of an appendicitis,—a large peri-nephritic abscess which he believed at first to be connected with the kidney, but on careful dissection, a narrow sinus was found leading down to a perforated appendix which lay behind the cæcum.

DR. SHEPHERD had seen the case reported by Dr. Armstrong and was still of the opinion that the case was one of appendicitis. The appendix had been found bent on itself and closely attached to the posterior wall. It had perforated beneath the iliac fascia and extended upwards.

*The Late E. H. Trenholme, M.D.*—The following resolution of regret was proposed by Dr. Hingston, seconded by Dr. Armstrong, and carried:—

“That this Society has learned with regret of the death of Dr. E. H. Trenholme, for many years a useful and active member: That it records its sense of his ability as a gynaecological surgeon and as an original observer.”

THE

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## CANADIAN MEDICAL ASSOCIATION.

The twenty-fourth annual meeting of this Association will be held in Montreal on the 16th, 17th and 18th September next.

The Association has been in existence for nearly a quarter of a century, and ought by this time to be in such a position that its meetings would be looked forward to with the greatest of interest by the members. But how lukewarm has this interest been? When one considers the fact that there are no less than 3,500 practitioners in the Dominion of Canada, it is, to say the least, disheartening to find, as has been the case within the last few years, an average attendance of only one hundred or one hundred and fifty members at the meetings. It is to be hoped that the profession will arouse itself from this apathetic condition and evince a great deal more interest in the future meetings of this Association.

In view of the meeting of the Canadian Medical Association being held just previously to that of the American Association of Physicians and Surgeons, it is expected that many of the representatives from the mother country and the continent will avail themselves of the opportunity and attend the next meeting of this Association.

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## BRITISH MEDICAL ASSOCIATION—MONTREAL BRANCH.

Dr. Ernest Hart, the able and energetic editor of the *British Medical Journal*, honoured our city with a visit the other day on his way from the East. At his request a meeting of the profession was hurriedly called to discuss with him the advisability of forming here a branch of the British Medical Association.

On the evening of June 19th some thirty medical men assembled in the rooms of the Medico-Chirurgical Society. Dr. Shepherd, as president of the Society, was called to the chair.

Dr. Hart gave a very interesting address, referring first to his trip round the world, and especially to his sojourn in Japan, where he spent much time in studying the history of medicine in that remarkable country. He then went on to state that it was the desire of the Council of the British Medical Association that colonial branches should be formed on the same lines as the so-called "Provincial Branches" at present so universal in Great Britain and Ireland; and which have been found such a source of strength to the mother association. The doctor stated that among the advantages accruing from membership and the annual payment of \$5.25 were included an *entrée* to the Metropolitan House in London, which afforded many of the privileges of a club, and the receipt of the *British Medical Journal*. He further proceeded to explain that local branches had a large latitude for autonomous government, organization and development according to their various needs. They might hold their meetings once a year or once a month, as they pleased, and either in one centre or in various centres they might meet either as the whole branch or in sections according to locality. Where societies were numerous and well developed they were not in any way interfered with, nor had it been found in the oldest settled communities that the prosperity of any local institution was in any way interfered with. Thus no local jealousies arose, and while the Association fulfilled its great purpose of uniting the whole profession of this great empire in bonds of friendship and brought them constantly into touch with each other it aimed at fulfilling only such local needs as were found to require supplementing. He concluded by expressing his gratification at the unanimous and cordial manner in which the proceedings had been taken.

The following resolutions were then moved and carried unanimously :—

Moved by Dr. Hingston, seconded by Dr. Geo. Ross : " That this meeting of members of the medical profession, resident in Montreal, cordially sympathizes with the work of the British

Medical Association in bringing the members of the medical profession throughout the whole extent of the British Empire into direct union and frequent intercommunication for the purpose of promoting mutual friendship, advancing scientific knowledge, and furthering the general interests of the medical brotherhood; and that it will use its best efforts to promote the extension of the membership of the British Medical Association throughout the Province of Quebec."

Moved by Dr. Geo. Armstrong, seconded by Dr. J. Chalmers Cameron: "That it is desirable that a Montreal branch of the British Medical Association be constituted, and it is hereby constituted, subject to the sanction of the Council of the British Medical Association, its laws and by-laws."

Moved by Dr. Girdwood, seconded by Dr. Wilkins: "That the following gentlemen be, and they are hereby appointed, officers of the Montreal branch, pending sanction by the Council of the Association: President, Dr. Hingston; 1st Vice-President, Dr. Geo. Ross; Treasurer, Dr. James Perrigo; Honorary Secretary, Dr. J. C. Cameron. Other members of Council—Dr. T. G. Roddick, Dr. F. W. Campbell, and Dr. Geo. Wilkins, with power to add to their number."

Dr. Cameron and Dr. Perrigo at once proceeded to enter upon their functions, and twenty-six of the gentlemen present signed forms of application to be admitted as members of the Montreal Branch of the British Medical Association. Dr. Cameron, hon. secretary of the branch, will be glad to have the names of other intending members throughout the city and province in order that as full a list as possible may be at once forwarded to the Council of the Association for election at their next meeting. We wish the branch every success.

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—The Ontario Medical Association has had another of its successful meetings at Toronto. We congratulate this live Association on its well-merited success, and regret that a combination of circumstances prevented the profession of this city from being more largely represented on the occasion referred to.

## Personal.

Dr. James Stewart and Dr. A. A. Browne are at present in Germany.

Dr. Craik, Dean of the Medical Faculty of McGill, leaves in a few days for London, where he will represent the Provincial Board of Health at the Sanitary Association.

The many friends of Dr. T. A. Rodger, chief medical officer of the Grand Trunk Railway, will regret to learn that he has been dangerously ill from erysipelas, having been confined to bed for the past six weeks. Hopes are now entertained of his speedy recovery.

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## Publisher's Department.

DR. COULTER'S COMBINED VAPORIZER AND INHALER.—We desire to express our very satisfactory experience in the use of the above inhaler. The points which we consider especially worthy of notice in this instrument are, firstly, its extreme simplicity. One drawback often experienced in the use of inhalers when left in sick rooms is their liability to get out of order. This is impossible with so simple an apparatus as this one; a vessel of water, a spirit lamp, and a sponge constitute the main parts of the apparatus. Secondly, as a vaporizer it cannot be too highly valued, and to those who have never employed it, it might at first seem incredible that such an immense diffusion could be produced from so small a quantity of disinfectant or volatile oil used with one of the smallest instruments. Only a few minutes are required to permeate an entire house. As a means of disseminating a disinfectant, it would be difficult, indeed, to surpass it; also as a means of introducing moist air into a chamber, so often required in the bronchial affections of children. It is an admirable contrivance, distributing the moisture evenly and rapidly. For disinfecting the room and clothing it is equalled only by the super-heated steam chamber, and where such cannot be obtained, the large inhaler of Dr. Coulter's can be substituted with advantage. It can be used in any room, large or small, no preparations being requisite; but the least valuable use to which the vaporizer can be put is the perfuming of rooms. We know of an instance where half a drachm of essence of lilac was sufficient to perfume a large house with the sweet smelling aroma by the aid of the vaporizer. Altogether we commend it as one of the best vaporizers for sterilizing rooms and producing hot or cold vapors as required.—*Canada Lancet*, June 1891.